



The Use and Productivity of Visual Aids as Retrieval Support in Police Interviews of Preschool-Aged Victims of Abuse

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Abstract

Professional use of external retrieval cues, such as various types of visual aids, has been utilized in investigative interviews of children for decades based on the assumption that aids can facilitate children's recollection of abusive incidents. Although analog studies and surveys have provided insight into various aspects of visual aid utilization, there is a scarcity of field studies that addresses the use of visual aids in large samples of authentic investigative interviews of preschool-aged children. In the present study, the use and productivity of visual aids were examined in 140 investigative interviews of 3- to 6-year-old children, all of whom disclosed abuse in cases that progressed to prosecution. The exploratory analyses focused on the overall use of visual aids, the types of questions posed along with visual aids when the interviewer directly asks questions regarding the investigated incident(s), and the extent to which the children provided forensically relevant information in response to questions used along with visual aids. It was found that visual aids were utilized to elicit information regarding the investigated incident(s) in 92% ($n = 129$) of the interviews, with emotion cards and drawing materials being the most common aids used. The highest proportion of questions asked alongside visual aids were directive (41.6%) and option-posing (37.3%) questions, followed by suggestive questions (17.9%), and a rather low proportion of open-ended invitations (3.2%). In addition to visual aids, open-ended invitations elicited the most forensically relevant information from the interviewees. The need for standardized guidelines and specialized training for the use of visual aids in investigative interviews of young children is discussed.

Keywords Police interviews · Visual aids · Preschool children · Question types · Productivity

Introduction

The utilization of visual aids, including drawings, body diagrams, puzzles, and dolls as retrieval support in investigative interviews of alleged child victims of abuse, has been the subject of enduring debate (Brown 2011; Brown et al.

2007; Bull 1995; Everson and Boat 1994; Faller 2007, 2015, Koocher et al. 1995; Lamb 1994, Lamb et al. 1996; Pipe et al. 1993; Pipe and Salmon 2009; Poole et al. 2011; Poole and Dickinson 2011; Samra and Yuille 1996; Wolfman et al. 2018). The efficacy of visual aids in investigative interviews with children was initially examined in the early 1990s when a consensus recommendation assessed the then state-of-the-art investigative techniques for child abuse allegations (Lamb 1994). At the time of the statement, "little was known about the effect of visual aids on the quality and richness of children's verbal reports of their abusive experience" (Lamb 1994, p. 1025). Simultaneously, other experts in the field emphasized the need for researchers to formulate evidence-based guidelines and recommendations for the use of props and toys in investigative interviews of children (Bull 1995).

Twenty years later, a review of the benchmarks in child investigative interviews during the last 40 years identified the use of visual aids as a particularly contested issue in the field of investigative interviewing (Faller 2015). This

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statement stems from the conflicting findings regarding the risks and benefits associated with the use of visual aids as retrieval support in interviewing of children. While some evidence, mostly from analog studies, suggests that visual aids can assist children in recalling accurate information of both neutral and emotional events (e.g., Barlow et al. 2011; Butler et al. 1995; Gross and Hayne 1999; Katz and Herszkowitz 2010; Patterson and Hayne 2011; Pipe and Salmon 2009; Poole and Dickinson 2014; Salmon et al. 2012; Woolford et al. 2015), skeptics indicate potential drawbacks, including shorter and less detailed responses, reduced accuracy and risk of false reports (Aschermann et al. 1998; Bruck et al. 2000; Hudson and Fivush 1991; Otgaar et al. 2012, 2016; Macleod et al. 2016; Poole and Bruck 2012; Poole and Dickinson 2011; Salmon 2001; Salmon and Irvine 2010; Strange et al. 2003; Willcock et al. 2006).

Despite conflicting findings, various professional interview protocols provide guidelines and recommendations for the use of visual aids in investigative interviews of children, including The CornerHouse Forensic Interview Protocol (Anderson et al. 2010), American Professional Society on the Abuse of Children (2012), and Home Office (2007). For instance, The Cornerhouse Forensic Interview Protocol known as RATAAC (e.g., Anderson et al. 2010) provides guidelines for the use of anatomical drawings for children to assess whether they can identify their own body parts as well as the use of drawings for memory support. However, the protocol specifies that the usefulness of aids depends upon the abilities of forensic interviewers and that aids should be limited to forensic interviews with individuals who are developmentally capable of using the tool (Anderson et al. 2010).

Research on the Use of Visual Aids in Investigative Interviews Children

In addition to analog studies, numerous surveys conducted over the two past decades have shown a widespread use of various visual aids in investigative interviews of children among various professionals (e.g., social workers, mental health, police officers). An early study on the use of visual aids showed that the large majority (92%) of interviewers used anatomically detailed dolls or free drawings (87%) in investigative interviews of children. In addition, 66% used anatomically detailed drawings and 47% used puppets/toys (Conte et al. 1991). A similar survey of professionals conducting investigations of child sexual abuse showed that 67% used projective drawing tests, 54% used timelines, 44% used anatomical drawings, 21% used anatomical dolls, and 34% used puppets or other toys (Bow et al. 2002). More recent surveys have revealed a similar widespread use of visual aids in investigative interviews of children. Nevertheless, these

studies indicate a shift from the prior dominance of specific types of visual aids (e.g., anatomically detailed dolls, puppets, or toys) towards the utilization of other types of aids. For instance, in a survey on investigative interviewers' experiences of conducting investigative child interviews, most of the interviewers (94%) reported the use of drawings to a certain extent during interviews (Magnusson et al. 2020). When asked about the purpose of using drawings, the most common reasons were to help the child describe places (72%) or objects (67%), to help the child feel comfortable during the interview (22%), as a memory aid (19%), or to build a rapport with the child (17%) (Magnusson et al. 2020). Additionally, 40% of the practitioners reported that they use other aids during child interviews, including photographs (15.9%), stress-reduction objects (10.2%), picture cards (9%), toys/teddy bears (8%), anatomical dolls (3.4%), body diagrams (2.3%), and emotion cards (2.3%).

Comparable findings were outlined in a similar study on police officers in England and Wales, where 88% of the police officers reported that they had used drawings during interviews with vulnerable witnesses (Mattison and Dando 2020). In addition, 72% confirmed that they used drawings during interviews often or almost always (Mattison and Dando 2020). A similar study from the Netherlands found that about one in five of professionals (19%) used human figure drawings and 22% used more than one tool in the interviews (Erens et al. 2020). Also, 19% used Duplo dolls during the interviews, which were originally developed for therapeutic use with child victims of war (Erens et al. 2020). While these studies indicate large variations in the types of visual aids used among investigative interviewers across countries, which also seem to change over time, the prevalent use seems to remain firmly established in contemporary practice.

In addition to the body of experimental studies and survey studies, a limited number of field studies have confirmed a widespread use of visual aids in real-world investigative interviews. Among existing research is a field study conducted in New Zealand that examined the use of visual aids in investigative interviews of children aged 6 to 16 (Wolfman et al. 2018). The study revealed that 62% of the interviewers incorporated one or more visual aid during the investigative interview (Wolfman et al. 2018). The interviewers predominantly asked direct ("wh-") questions alongside visual aids. Visual aids did not increase (or decrease) children's productivity in reporting forensically relevant information (Wolfman et al. 2018). A Finnish field study found that the use of anatomically detailed dolls was associated with significantly longer questions from the interviewer, shorter responses from the children, and a decrease in the number of details reported by the child, as well as significantly more unspecific suggestive utterances compared with interviews where dolls were not employed (Santila et al. 2004). In

addition, another study found that the use of a human figure drawing and the associated questions elicited an average of 86 new forensically relevant details (Aldridge et al. 2004). Interestingly, this study also showed that the drawings were particularly productive with preschool-aged children who provided an average of 95 additional details after the drawing was introduced, despite having previously “exhausted” their memories (Aldridge et al. 2004).

While analog studies, surveys, and certain field studies have contributed to our understanding of various facets of visual aid utilization, there exists a scarcity of field studies that encompass substantial samples of real-world investigative interviews of vulnerable children such as preschool-aged children. This gap in research is noteworthy, considering that young children are regarded as a target group for the use of visual aids as a retrieval support to overcome linguistic and retrieval difficulties (Pipe et al. 1993). Although young children are capable of recalling information about past events that they have experienced after delays of months and years, they typically recall less episodic information, briefer accounts and employ less exhaustive retrieval strategies than older children (Bauer and Larinka 2016; Brown et al. 2007; Lee et al. 2016; Oakes and Bauer 2007; Otgaar et al. 2012; Sluzenski et al. 2006). Moreover, young children under the age of six have been found less likely to initially disclose experiences of abuse when compared to older, school-aged children (Azzopardi et al. 2019). This disclosure pattern is influenced by a complex interplay of factors, including the child’s relationship with the suspect, the severity of the abuse, suspects’ violence histories, the time delay reporting to the police, and any prior disclosure made by the child (Leach et al. 2017). Given these complexities, it is believed that employing various external retrieval cues, such as aids and tools that provide visual references, can offer an alternative to exclusive reliance on verbal communication to facilitate the disclosure of forensically relevant information for younger children (Brown et al. 2007; Pipe et al. 1993). Nevertheless, certain considerations specifically pertaining to preschool-aged children should be taken into account. Central to the discussion is whether young children have developed sufficiently mature skills in causal reasoning, perspective-taking, language, and memory bindings to engage in and understand the core feature of visual aids (Grave and Blissett 2004; Lloyd et al. 2009; Poole and Dickinson 2011). For example, when interviewers employ external retrieval cues, such as drawings, body diagrams, or dolls which are meant to represent the child’s personal experiences of abusive incidents, young children might struggle to grasp or misinterpret the symbolic nature of these visual aids (Bialystok 2000; DeLoache et al. 1997; DeLoache and Marzolf 1995; Liben 1999; Thomas et al. 1999; Zelazo et al. 1999). In addition, the more children are attracted to the representation as an interesting object itself, such as a puzzle or

a toy, the more difficult it is for them to grasp the symbolic information it conveys (DeLoache et al. 1997; Thomas et al. 1999; Zelazo et al. 1999).

There is also a potential risk that interviewers’ preconceptions, assumptions, and biases can influence their interpretations of children’s interaction with the visual aids, as well as the questions they pose when facilitating young children’s recall using visual aids (Brown 2011; Brown et al. 2007; Pipe et al. 1993; Poole and Bruck 2012). Importantly, as the theoretical rationale for the use of visual aids is rooted in clinical practice, where aids are used in structured treatment models for revealing trauma-specific components (Allen et al. 2012; Axline 1947; Cohen et al. 2018; Kalff 1980), they serve a different purpose in the context of forensic retrieval support—that is, to facilitate children’s narratives regarding *alleged* traumatic experiences (Poole and Bruck 2012; Wolfman et al. 2018).

The potential risks associated with employing multiple tools, potential interpretations of children’s interaction and responses to visual aids, as well as the utilization of suggestive techniques found in numerous field studies of investigative interviews (Baugerud et al. 2020; Johnson et al. 2015), emphasize the importance of caution when employing visual aids, especially in interviews with young children (Brown et al. 2007; Pipe et al. 1993; Poole and Bruck 2012).

In summary, our understanding of the risks and benefits associated with the use of visual aids in real-world investigative interviews, especially with preschool-aged children who have disclosed abuse during the interview, remains limited. The majority of available evidence is derived from analog studies that focus on non-traumatic events potentially lacking ecological validity and the ability to generalize their findings. Furthermore, previous field studies have predominantly involved school-aged children or mixed-age samples. Therefore, further research, particularly in large samples of investigative interviews involving preschool children, is essential to gain more comprehensive insight into how visual aids impact the recollections of traumatic events in this vulnerable group of interviewees.

The Purpose of the Current Study

To address this specific research area, the present field study examined the utilization and productivity of visual aids in 140 investigative interviews with children aged 3 to 6 years, all of whom disclosed incidents of abuse during these interviews. In accordance with research which has highlighted the role of visual aids as memory aids in assisting children to articulate details related to the investigated event(s) (e.g., Erens et al. 2020; Magnusson et al. 2020; Santila et al. 2004; Wolfman et al. 2018), the analysis centers on the overall use of visual aids in the substantive phases of the interviews, where interviewers facilitate the children’s recollections of

the investigated incident(s), and the types of questions posed along with visual aids when the interviewer directly asks questions regarding the investigated incident(s). Moreover, we investigated the productivity of the use of visual aids in the interviews, in terms of examining the extent to which the children provided forensically relevant information in response to questions used alongside visual aids.

Methods

Sample and Case Characteristics

The sample for this study comprised transcripts of 140 investigative interviews of preschool-aged children who were alleged victims of physical and sexual abuse, of whom 63% ($n = 89$) were girls and 37% ($n = 51$) were boys. The children's ages ranged from 3 to 6 years ($M = 56.23$ months; $SD = 8.74$, age range = 39–78 months) and included 3-year-olds ($n = 27$, 36–47 months), 4-year-olds ($n = 56$, 48–59 months), 5-year-olds ($n = 50$, 60–71 months), and 6-year-olds ($n = 7$, 72–75 months). None of the children were attending school at the time of their interview and were therefore labeled as preschool-aged children.

The children were alleged victims of violence ($n = 87$, 62%) or sexual abuse ($n = 53$, 37%). All children made a disclosure of sexual abuse or violence during the interviews, where alleged incidents of abuse ranged from spanking, beating, exposure, or fondling of the perpetrator's genitals to penetration.

Transcripts of the interviews were selected from a national sample of all investigative interviews of preschool-aged children conducted in Norway between 2015 and 2017 ($N = 550$). The interviews were conducted as part of a formal criminal investigation of child sexual abuse or violence, all of which progressed to a court hearing. The current study is part of a national research initiative funded by the Ministry of Justice and Public Security, with the primary aim of investigating the quality of investigative interviews in a national sample of preschool-aged children. The study was conducted in accordance with the 1964 Helsinki Declaration. Legal and ethical permissions were granted by the State Attorney, the National Police Directorate, and the Data Inspectorate.

Interviewers and Interview Method

The interviews were conducted by trained police investigators from 12 police regions, all of whom had completed the same training course in the national specialist child witness interviewing model known as the Sequential Interview Model (SI model). No additional information regarding the interviewer's experience was available.

The SI model builds on the Extended Forensic Interview protocol (EFI) (Carnes et al. 1999, 2001), and is nationally implemented for investigative interviews of vulnerable witnesses, including preschool-aged children and individuals with disabilities or psychiatric diagnosis (Langballe and Davik 2017, p. 165–183). The SI model includes a pre-substantive phase of rapport building, creating a supportive environment, and practicing the dialogical structure, including ground rules, before transitioning to the substantive phase focusing on exploring the alleged event, which is commonly split into two or more sessions with breaks before closing phase. A central element of the SI model is the use of props. However, how the props are used and what effects they have on the children's narratives have not been examined, according to the developers of the model (Langballe and Davik 2017). Information regarding the recommendations and guidelines for the use of visual aids in accordance with the SI model is sparse, despite a general recommendation that visual aids (such as a picture book, a puzzle, or drawing materials) can be used in the pre-substantive phase of the interview to help the child start talking or to explore the child's cognitive abilities. Moreover, drawings can be used in the substantive phase of the interview if the child is unable to talk about the experience(s). To make themes tangible to the child, the interviewer may draw while talking with the child—for example, the child's house, parents, siblings, and pets. In addition, photographs of the child's home and family, or other people related to the case, can be introduced to help direct the child's attention to the topic in focus (Langballe and Davik 2017). It is stressed that photographs should be introduced in an open manner. A general recommendation for interviews conducted in accordance with the SI model is that the interviewer follows up with open-ended, but concrete questions, if the child brings up abuse or other relevant topics for the case. Moreover, if visual aids are used in investigative interviews to facilitate relevant topics for the case, it is emphasized that proper use of visual aids is when they are used in a deliberate and structured manner (Langballe and Davik 2017).

Procedure

Coding of Interview Transcripts

All personal information was removed from the interview transcripts to ensure anonymity and confidentiality at the time of data collection. The interview transcripts were manually coded by human coders with a detailed and exhaustive coding scheme that captured the detailed verbal dynamics between the interviewer and the interviewee by coding each sequence of interviewer question/interviewee response pairings (turns) across the course of the interviews. In the coding procedure, we differentiated between substantive and

non-substantive turns, based on the content of the interviewer's question types.

Substantive turns included on-topic questions where the interviewer asks questions directly regarding individuals, objects, events, or actions related to the investigated incident(s) or facilitates the child's responses regarding the investigated incident(s).

Non-substantive turns included off-topic questions where the interviewer asks questions or facilitated the child's responses regarding neutral topics that were *not* related to the investigated incident(s).

Coding of Interviewer Questions Used Alongside Visual Aids

Interviewers' questions used alongside visual aids were coded in accordance with the National Institute of Child Health and Human Development (NICHD) investigative interview coding scheme (Lamb et al. 2007), used in earlier studies (e.g., Johnson et al. 2015). The coding procedure differentiated between the following main categories of interviewer questions:

Open-ended invitations included questions or utterances encouraging elaborate free-recall responses from the child about the alleged incident that do not limit the child's focus except in a general way (e.g., "Tell me everything that happened") or questions where the interviewer uses details disclosed previously by the child to formulate focused follow-up questions (e.g., "You mentioned that something happened in that room. Tell me more about that.").

Facilitating utterances include prompts that facilitate or rephrasing the child's ongoing response in a non-suggestive way (e.g., "OK," "Yes," "Uh-huh," "So he hit you" immediately after child says "and then he hit me").

Directive questions include "Wh-" questions (what, when, where, who, how) that focus the child's attention on information previously mentioned by the child and request additional specific details about aspects related to the alleged incident that the child has previously mentioned (e.g., "Where did that happen?", "What color was that car?" When the car was previously mentioned by the child).

Option-posing questions include closed-ended questions that focus the child's attention on aspects or details not previously mentioned by the child, requiring confirmation, or selection of a particular interviewer-given option. Option-posing questions can be formulated as yes/no questions (e.g., "Did he hit you?") or forced-choice questions where the interviewer offers the child pre-defined responses to choose from (e.g., "Did he touch you over or under your clothes?").

Suggestive questions include questions or utterances where the interviewer strongly communicates or implies that a particular response is expected from the child or that assumes information or details that have not been previously disclosed by the child. Suggestive questions/statements were categorized in the following subcategories: *leading questions*, introducing information not disclosed by the child and stated without any prior information from the child (e.g., "He forced you to do that, didn't he?"; "Did it hurt when he hit you?"—when the child has not mentioned that anyone had hit her/he.); *repeated leading questions*, presenting the same question multiple times in the same interview when the child already answered the question asked; questions and statements with the use of *positive or negative reinforcement*; leading questions and statements that *refer to other people's statements* by referring to what other children or adults believe or have said about the topic of concern, *indicating questions and statements* include questions that elicit obedience to authority by indicating or concluding from the interviewer's point of view and *speculating questions and statements* that include questions promoting speculation by removing the child from direct experience, asking what *might* have happened, or encouraging the child to speculate, guess, or visualize about different matters, such as other people's intentions and state of mind or reasons for actions performed by other persons.

Coding of Children's Responses

Children's responses were coded as either "productive" or "non-productive" responses. *Productive responses* included those in which the children provided forensically relevant information in response to the interviewers' questions related to the investigated incident(s) during the rapport-building phase, including details identifying or describing individuals, objects, events, or actions related to the investigated incident(s). *Non-productive responses* included responses where the interviewee did not provide further information about the investigative incident(s). The non-productive category included omissions (i.e., no answer, don't remember, not sure), resistance (i.e., don't want to/ can't tell/I don't want to responses), restatement of previous utterance, denials (i.e., "nothing happened") or silence (e.g., Wolfman et al. 2018). Sequential analyses (Bakeman and Quera 2011) were used to determine the associations between interviewer question types and child responsiveness (productive vs. non-productive responses) in question-response pairings where visual aids were used. This approach provides information regarding how a particular behavior (type of question) precedes another type of behavior (response) in a chain of interactions in the interviews. The codes for interviewers'

questions and for children's responses were mutually exclusive (i.e., only 1 code could be given for a particular speech act) and exhaustive (i.e., there was always a code for every given behavior) (Bakeman and Quera 2011).

Reliability Coding

All ratings of the interviewer's question types and children's responses were conducted by two independent coders who trained on an independent set of interview transcripts until they reached an agreement of at least 85%. Hence, 30% ($n=42$) of the transcripts were independently coded by the coders to ensure that the coders remained equivalently reliable. The primary coder, which coded the majority of the interview ($n=100$), was blind to the hypotheses and purposes of the study. Excellent intra-rater reliability was achieved for both the interviewer's questions (Cohen's $\kappa=0.90$) and the children's responses (Cohen's $\kappa=0.89$).

Data Analysis

Exploratory data analysis (e.g., Komorowski et al. 2016; Tukey 1977) was used to identify and visualize main patterns in the data, including the overall use of visual aids in the interviews, the number of and various types of visual aids used in the interviews, the distribution of types of questions posed along with visual aids when the interviewer directly asks questions regarding the investigated incident(s), and the extent to which the children provided forensically relevant information in response to questions used along with visual aids. Graphical representations were employed to present the distributions and frequency in the data. A chi-square test was performed to investigate the relation between types of questions and children's productivity.

Results

Overall Use of Visual Aids in the Investigative Interviews

A total of 36,229 turns were coded across 140 interviews, of which 57.4% ($n=20,770$) were classified as *substantive turns*, which included interviewer question/interviewee response pairings (turns), where the interviewers' asked questions or facilitated the child's response regarding the investigated incident(s) in the interviews. The remaining 42.6% ($n=15,459$) were classified as *non-substantive, off-topic turns* where the interviewers' asked questions regarding neutral, non-substantial topics not related to the investigated incident(s). The following analyses were directed towards examining the patterns of visual aid usage observed in the substantive phase of the interviews. As

shown in Fig. 1, visual aids were introduced in about one-fourth (23.6%) of all the substantive turns across the 140 interviews.

Number of Visual Aids Used in the Investigative Interviews

Figure 2 further provides an overview of the number of visual aids used in the investigative interviews during the substantive turns. In the majority of the interviews ($n=129$, 92.1%), at least one visual aid was used alongside in-topic questions, in which the interviewer directly asked questions or facilitated the children's responses about the investigated incident(s). Furthermore, two or more visual aids were employed in 64.2% of the interviews, and three or more aids were utilized in 31.6% of the interviews to facilitate children's recollection of the investigated incident(s). On average, 2.16 visual aids ($SD=1.01$, range 1–5) were used alongside questions directly related to the investigated incident(s).

Types of Visual Aids Used in Substantive Turns

Figure 3 provides an overview of the various *types* of visual aids used to facilitate children's recollection of the investigated incident(s) among the interviews where visual aids were employed ($n=129$). The most frequently used visual aid was *emotion cards*, asking children to identify facial emotions, such as sadness, happiness, or fear, printed on cards (62.8%, $n=81$). This was followed by *drawing material* (55.8%, $n=72$), in which either the child or the interviewer drew different aspects of the alleged offense during

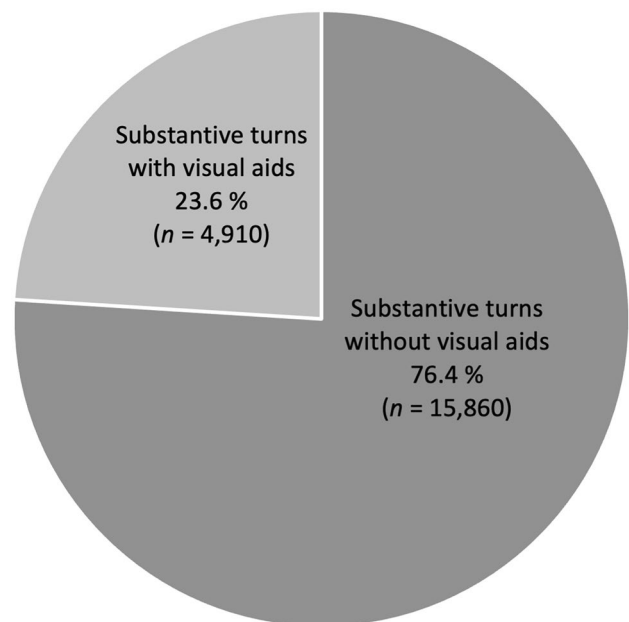
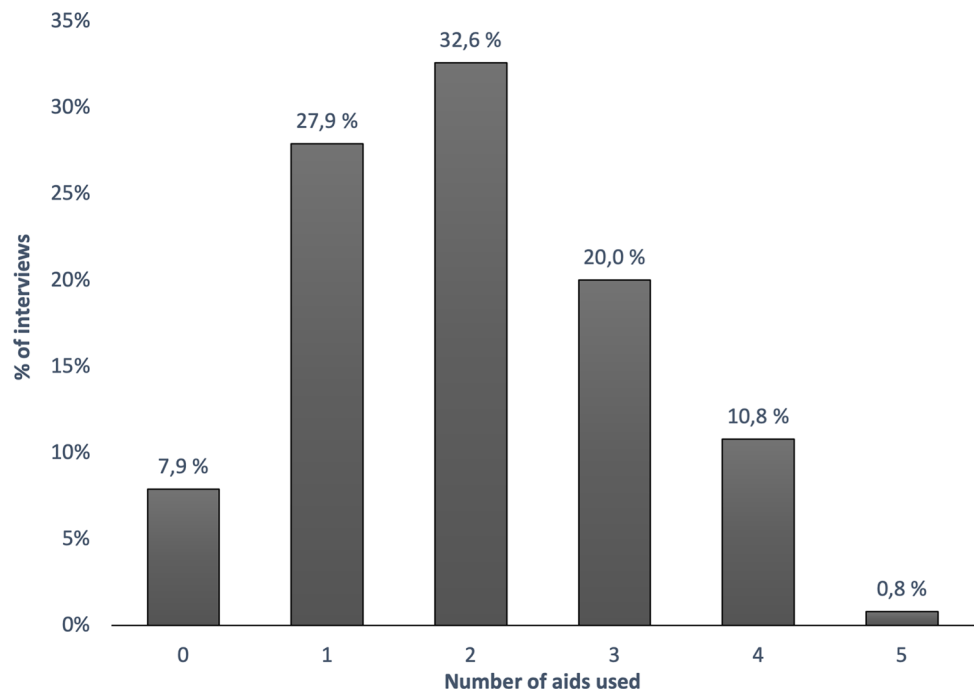


Fig. 1 Proportion of substantive turns where visual aids were used in the interviews

Fig. 2 Number of visual aids used to facilitate children’s recollection of the investigated incident(s)



Types of visual aids used

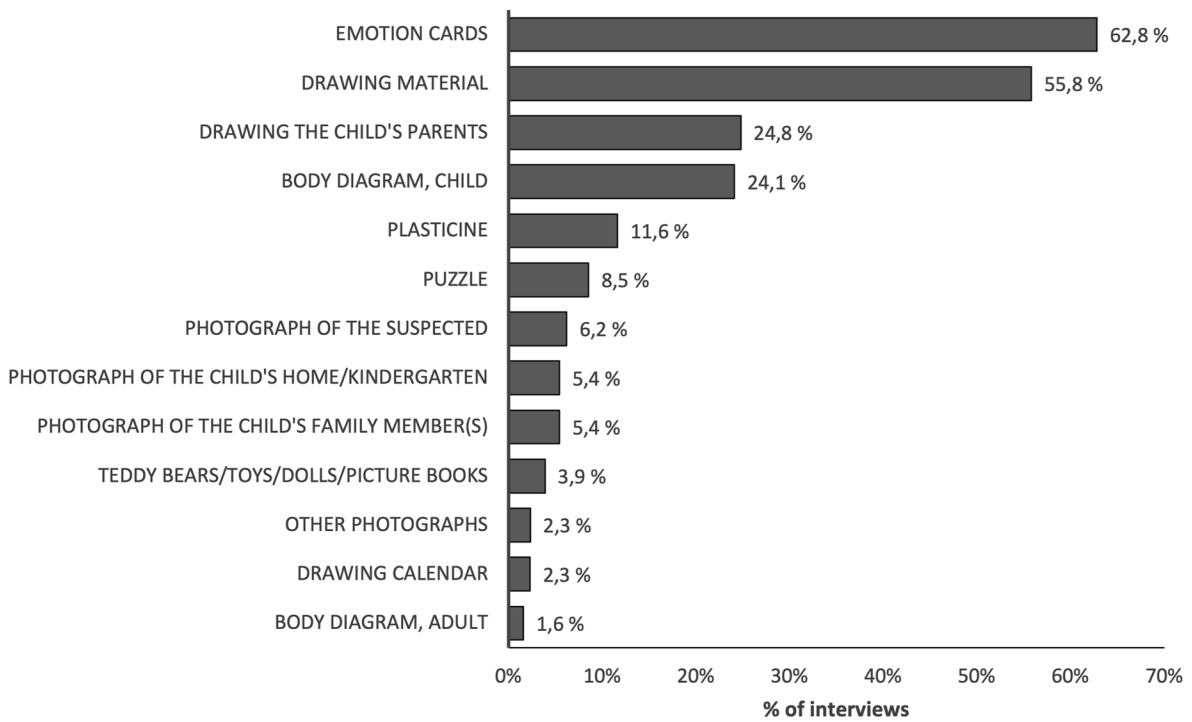


Fig. 3 Types of visual aids used to facilitate children’s recollection of the investigated incident(s)

the interview. Additionally, in 28% ($n=36$) of the interviews, a combination of drawing material and emotion cards was present. Drawing the child's parents, introduced as a visual aid in 24.8% ($n=32$) of the interviews, was categorized as a distinct category of using drawing material in the interview. Another category labeled *Teddy Bears/Toys/Dolls/Picture Books* was present in five (3.9%) of the interviews that used at least one of the aforementioned aids. Lastly, the category labeled *other photographs* (2.3%, $n=3$) included three interviews where photographs were introduced in the interviews. These photographs included images of a particular object relevant to the case, marks and bruises on the child's body, and a picture of the police called to the location.

Interviewer Question/Utterance Types Used in Visual Aids

In the interviews where visual aids were used ($n=129$), a total of 4910 interviewer questions were posed alongside visual aids to facilitate the children's recollection of the investigated incident(s). There was a significant variation when the first visual aid was introduced during the course of the interviews, ranging from turn 1 to 494 ($M=99.9$, $SD=75.05$). On average, 38.5 ($SD=20.05$, Range = 1-164) interviewer questions were asked to the children along with visual aids in the interviews.

Facilitating utterances (i.e., prompts that facilitate or rephrasing the child's response in a neutral manner) and question types (e.g., open-ended, directive, yes/no, forced-choice, and suggestive questions) asked by the interviewer were calculated separately. Facilitating utterances comprised 41.6% ($n=2046$) of the interviewer prompts used alongside visual aids. Figure 4 provides an overview of the distribution of question types used alongside visual aids in the remaining substantial turns ($n=2864$) where the interviewer asks questions directly

regarding the investigated incident(s). The most frequently used questions were directive questions (41.6%), followed by yes/no questions (33.9%), with a similarly low distribution of open-ended invitations (3.2%) and forced-choice questions (3.4%). Additionally, 17.9% ($n=512$) of the questions asked alongside visual aids were suggestive questions, including questions or utterances where the interviewer strongly communicates or implies that a particular response is expected from the child or assumes information or details that have not been previously disclosed by the child. Most of the suggestive questions used alongside visual aids were leading questions ($n=361$), followed by repeated leading questions ($n=128$). The other subcategories of suggestive questions including questions that use positive or negative reinforcement or pressure ($n=5$), leading questions that refer to other people's previous statements ($n=6$), and indicating or speculating questions and statements ($n=12$) were rarely used alongside visual aids.

Children's Productivity in Response to Interviewer Questions Using Visual Aids

We further investigated children's productivity in terms of the extent to which the children provided forensically relevant information in response to questions asked by the interviewers using visual aids.

Figure 5 provides an overview of the percentage of children's productivity in terms of whether they elicited forensically relevant information in response to open-ended, directive, option-posing (yes/no and forced choice), and suggestive questions used with visual aids.

A chi-square test was performed to examine the relation between types of question types and children's productivity. The relation between these variables was significant $X^2(4, N=2864)=337.2, p<0.001$. Open-ended questions were

Fig. 4 Distribution of question types used alongside visual aids

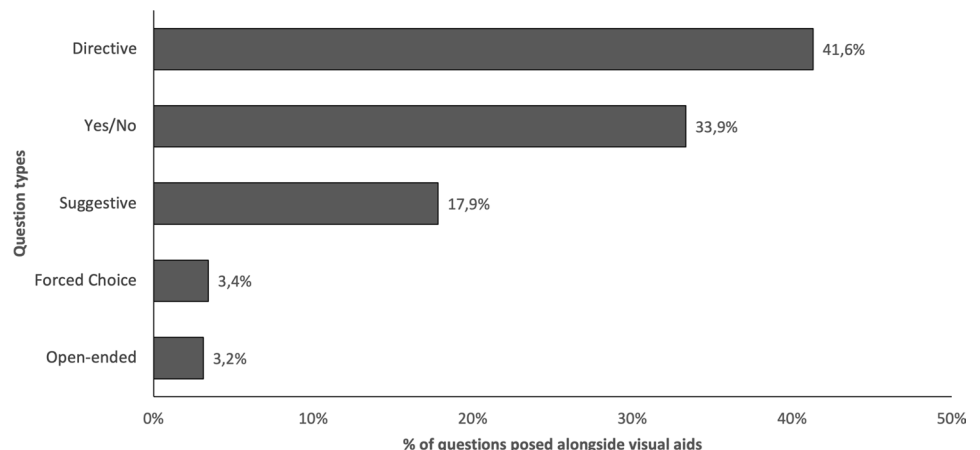
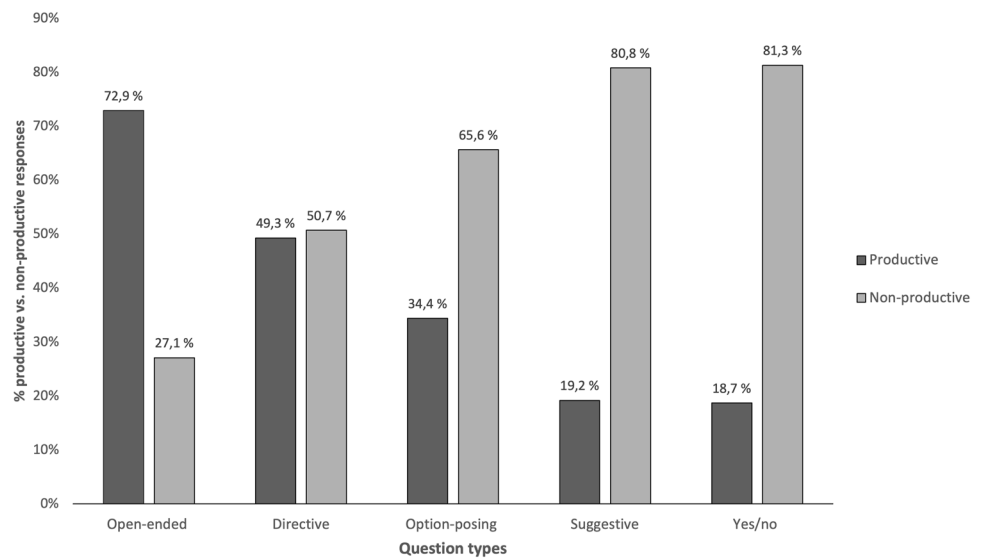


Fig. 5 Children's productive vs. non-productive responses in response to interviewer questions used alongside visual aids



found to elicit most forensically relevant information when used alongside visual aids. Among the open-ended invitations asked alongside visual aids to facilitate the children's recollection of the target event, 72.9% elicited forensically relevant information from the children. Directive questions elicited a lower (49.3%) but still markedly higher percentage of forensically relevant information from the children compared to yes/no and suggestive questions, which showed low percentages of productivity.

Discussion

The present field study aimed to examine the overall use of visual aids in 140 investigative interviews of 3- to 6-year-old children. The examination encompassed the overall use of visual aids, the number and types of visual aids used in the interviews, as well as the types of questions posed alongside visual aids when the interviewer asked questions directly about the investigated incident(s) and the extent to which children provided forensically relevant information in response to these questions. The findings revealed that visual aids are extensively employed by police investigators during investigative interviews of preschool-aged children. Specifically, visual aids were used to facilitate the children's recollection of the investigated event in 92% ($n = 129$) of the interviews in the sample. Moreover, visual aids were introduced in approximately one-fourth (23.6%) of all the substantive turns across the interviews when the interviewers asked questions directly regarding the investigated incident(s).

These findings demonstrate that the use of visual aids seems to be a routine and widespread practice in investigative interviews with preschool children as tools to facilitate the children's recollection of the investigated incident(s). This observed pattern is not unexpected, given similar findings across studies that have reported a common use of visual aids in investigative interviews with children by professionals (e.g., Bow et al. 2002; Conte et al. 1991; Magnusson et al. 2020; Santila et al. 2004; Wolfman et al. 2018). Furthermore, within the wide range of various visual aids utilized in the interviews, we identified 13 main categories of different visual aids in the investigative interviews. The use of these different types of visual aids revealed several interesting tendencies in the sample. First, it became evident that certain types, such as emotion cards and drawing material, as well as certain combinations of visual aids, were more commonly integrated by police investigators than others. Second, some police investigators employed visual aids that were rarely used by other investigators, including teddy bears, toys, dolls, picture books, drawing calendar, body diagram of adult bodies, and various photographs. These observed patterns raise questions about whether there is a consensus recommendation among practitioners regarding the general use of visual aids and the use of specific types or multiple visual aids to facilitate children's recollection of an incident under investigation.

Facilitating utterances constituted 41% of the interviewer prompts used alongside visual aids, indicating that the interviewers who used visual aids extensively facilitated children's recollections of the investigated incident(s) in a neutral manner. In terms of question types, directive questions

were most frequently asked alongside the use of visual aids, consistent with findings from other field studies (Wolfman et al. 2018). Furthermore, within the questions posed alongside visual aids, there was a notable prevalence of suggestive questions (17%) compared to open-ended invitations, which comprised only 3% of the questions asked alongside visual aids when facilitating children's recollection of the investigated incident(s).

Of particular interest is the proportion of open-ended invitations, which mirrors the findings from Wolfman et al.'s (2018) field study involving children across a wide age range. These findings have several implications. The observed low distribution of open-ended invitations alongside visual aids in this study sample suggests that, contrary to recommendations, these aids are predominantly *not* used in an open manner in interviews of preschoolers. Few instances were observed where police investigators allowed children to provide their own free-recall accounts of their abusive experience with visual aids. The majority of the questions asked in the interviews alongside visual aids (55%) were either option-posing or suggestive questions. This observed low distribution of open-ended invitations and high distribution of suggestive and closed questions used along with visual aids is a cause for concern, given that suggestive questioning is associated with a high risk of increasing the number of false reports (Koocher et al. 1995; Poole and Bruck 2012). It is indeed risky and contrary to recommended guidelines to use suggestive questions when encouraging the child to talk about topics related to the investigated incident(s). Such practice has the potential to contaminated reports to such an extent that it interferes with the investigations, while also reducing the likelihood that children's allegations being admissible in court, thus consequently compromising the rule of law.

While the use of open-ended invitations alongside visual aids was relatively low, it was discovered that employing open-ended questions with visual aids facilitated the retrieval of the most forensically relevant information from the children compared to other question types. This finding underscores the potential of visual aids to enhance communication with young children during investigative interviews when utilized in conjunction with open-ended prompts, hence, in a purposeful manner. Furthermore, this discovery aligns with the empirical evidence supporting the superiority of open-ended prompts in investigative interviews of children. Open-ended prompts tap into free-recall memory and enable children to provide spontaneous accounts of their experiences in their own words (Lamb et al. 2003). Additionally, research has generally shown that open-ended free-recall prompts elicit more detailed and accurate reports from children, as compared to directive, option-posing, and suggestive questioning (e.g., Davies et al. 2000; Hershkowitz

et al. 1997; Hershkowitz 2001; Lamb and Fauchier 2001; Price et al. 2013; Sternberg et al. 1996).

In contrast to the productivity of open-ended invitations, suggestive and option-posing questions were found to be the least productive question types when used alongside visual aids. Although these question types yielded considerably lower productivity compared to invitations and directive questions, approximately 20% of the suggestive questions managed to elicit productive responses in terms of forensically relevant information from the interviewees.

The use of suggestive questions in investigative interviews with children is associated with an enhanced risk of obtaining unreliable information, leading to inaccuracies in children's reports and potentially compromising the child's credibility (Vrij et al. 2014). The risk may be exacerbated when suggestive questioning is combined with various visual aids (Brown 2011). However, the low productivity observed in response to both suggestive and option-posing questions may also suggest that the children, to a large extent, exhibited resistance to suggestive techniques, even when these techniques were employed in conjunction with visual aids. This finding reinforces prior findings indicating that preschool-aged children can display resistance, even in the face of suggestive questioning techniques (Milne and Bull 2003; Poole and White 1991).

Strengths and Limitations

The current study exhibits several strengths. Firstly, it contains a substantial sample of authentic investigative interviews with preschool-aged children wherein visual aids were utilized to facilitate the children's recollection of abuse in cases that progressed to prosecution. In contrast to prior field studies, which often encompassed a broader age range, with a primary focus on school-aged children, this study contributes to the literature by shedding light on the use of visual aids in investigative interviews with children as young as 3 years old. Furthermore, the detailed coding procedure, which identify where and how the visual aids were integrated in the interviews, offers an in-depth investigation of the contemporary practice in the use of visual aids. However, there are several limitations that should be acknowledged. Since all the interviews in the sample originated from severe cases that proceeded to prosecution, we were unable to examine whether the observed pattern of visual aids use would differ in less severe cases or in instances where children did not disclose abusive incidents. Additionally, as all the interviews were initial investigative interviews, we were unable to examine whether the use of visual aids varied in cases where repeated interviews were conducted with the same child. Another limitation is the lack of access to information regarding whether or how the interviewers assessed

the children's individual need for retrieval support, and consequently, their use of visual aids in the interviews.

Implications and Future Research Directions

The findings of the present study collectively illustrate that visual aids are commonly employed in investigative interviews of preschool-aged children who are alleged victims of abuse. However, the lack of empirical support for the broad range of visual aids used in real-world police interviews underscores the necessity for caution when employing them unless it can be substantiated that they are used in a structured and purposeful manner, aligning with best practice recommendations. Our findings underscore the imperative need for scientific guidelines governing for the use of visual aids in investigative interviewing. Such guidelines should include specific clarity on the intended purpose and offer precise instructions and parameters for the recommended use of visual aids. Moreover, a systematic evaluation of adherence to such guidelines should be implemented as best practice recommendation whenever visual aids are used to support retrieval in investigative interviews of children of all ages.

Standardized protocols and specialized training for individualized feedback on the use of visual aids are necessary to minimize the risk of employing suggestive questioning along with visual aids. This issue emerges as a key concern in our study. Studies emphasize the importance of best practice guidelines, particularly the importance of multidisciplinary specialized training approach for interviewer that focuses on children's productivity and the reduction of bias when interpreting their interaction with visual aids. In addition, given the limitations in recourses for individualized training and feedback, there is a clear need for novel and innovative training and feedback recourses related to the use of retrieval support in investigative interviews of children in general, and particularly among young children (e.g., Baugerud et al. 2021; Cyr et al. 2021; Haginoya et al. 2023; Lawrie et al. 2020; Pompemma et al. 2015; Røed et al. 2023; Salehi et al. 2022).

Lastly, it is also crucial to reflect on the experience of the overuse of visual aids from the perspectives of interviewees and how the dynamics in the interviews are affected when an excessive number of different types of visual aids are introduced in interviews of children as young as 3 years of age. Another relevant question is whether children as young as 3 years of age are developmentally capable of utilizing the visual aids as intended by the interviewer and to what extent the interviewers consider the potential benefits and risks associated with utilizing visual aids regardless. Gaining a broader understanding of how interviewers utilize visual aids, and with whom, may contribute to better identification of the contexts in which aids are more or less likely to be beneficial or detrimental as retrieval support in investigative

interviews. Thus, the benefits of visual aids as retrieval support in investigative interviews need to be further evaluated, particularly in large samples of authentic investigative interviews involving children of different ages, including the youngest ones. Moreover, to advance our understanding of investigative interview practices among different cultures and for the purpose of developing culturally sensitive interview guidelines, it is crucial that future research is directed towards exploring how retrieval support manifests within various cultural contexts. An investigation of this nature has the potential to contribute to improved guidelines regarding the risks and benefits of visual aids as retrieval support in investigative interview practice worldwide.

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Data Availability The data are not publicly available due to the sensitive nature of the research and the ethical permissions granted.

Declarations

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent The researcher has been granted access to sensitive data, without collection of informed consent (exemption from the duty of secrecy) by The State Attorney, the National Police Directorate, and the Norwegian Data Protection Authority.

Conflict of Interest The authors declare no competing interests.

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