

**Maltreated Children's Memory for a Traumatic Separation:
Relations between Stress, Dissociation and
Memory for the Event**

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Abstract

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This thesis serves as a pre-study of the research project "Children's Memory for Traumatic Separations: An investigation of children removed from home by the Child Protective Services". The author has contributed in all steps of the study, such as in the original planning, in data collection, and in training, coding, and reliability testing of all dependent measures employed. The author has conducted the child interviews and testing.

There is an ongoing debate whether memory for traumatic events can be lost, or if there are unique influences such as dissociation (e.g., the disruption of normal integration of memories, perceptions, and identity into a coherent sense of self) superseding general memory mechanisms (e.g., age differences, forgetting, and memory illusion). The impact of maltreatment-related sequel on basic memory processes is unsettled. Previous studies of trauma and memory have primarily been field research projects. Very few, if any, reports exists that both hold a high ecological validity and employ experimental demands, which enables full control of the situation to be studied. The present thesis is therefore a pioneer work, as it investigates real life phenomenon employing an experimental design.

To study memory for real life traumatic events within a cognitive developmental approach, a removal situation was chosen as the event to be encoded and later recalled, and 12 maltreated children aged 3 to 12 years old were recruited. At the day of removal a researcher observed and registered the child's and the parents' reactions, and the placement procedure. The children accomplished a structured memory interview one week and three months after the removal day, Child Behavioral Checklist and Trauma Symptom Checklist for Young Children were filled out, and cognitive tests were taken. Biological parents and the CPS caseworker were interviewed, and case report information was registered.

Results showed that degree of stress experienced during removal related to accuracy in the children's memory. Mixed results were found regarding age and the amount and accuracy of information given, and between memory and PTS symptoms. Due to dissociation, a slightly negative impact on memory was found. Preliminary results are discussed in light of previous research on maltreated children's memory for trauma and corresponding theories.

Preface

Since the beginning of this project in the spring of 2004 I have learned a lot about planning, preparing, and executing a research project; research being a time consuming process necessary to experience and *give time* to mature. During the course of the project I have spent countless hours with my supervisor and fellow researcher discussing research perspectives and ethical dilemmas during the original planning and as it processed; designing measures for data collection; getting the necessary public permissions from the Regional Committee for Medical Research Ethics, the Ministry of Children and Equality, the Board of Confidentiality and Research, and the Data Inspectorate; presenting the project for the cooperating Child Protective Services; collecting the data; adjusting existing coding schemes to our interview material, training to be reliable in its use; coding and scoring the material; conducting statistical analyses; presenting the project and results at national and international conferences; and the writing process. Being a part of this research project have made it possible for me to combine two main areas of interest, maltreated children and the Child Protective System in Norway, and cognitive and psychopathological developmental psychology.

In this process several people have provided valuable support and professional advice. My thanks goes to Professor Gail Goodman for her advice on planning the study and developing the interview guide for data collection; PhD student Gunn Astrid Baugerud for valuable discussions, great cooperation, and transmitting energy to proceed this research project; colleagues in the Child Protective Services for useful feedback; members of the EKUP lab group for valuable help and thoughtful comments; and my brothers for encouraging support.

My greatest thanks go to my mentor and supervisor Annika Melinder for her dedication, support and inspiration throughout these years. A special thank for her courage to develop a challenging research project in light of the importance to gain more knowledge about an especially vulnerable group in our society, maltreated and traumatized children. During these years Melinder has also given me the opportunity to develop my academic skills through participation in courses, lab groups and conferences, which I am grateful for.

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Table of Contents

Abstract	II
Preface	III
Table of Contents	IV
Introduction	1
Memory systems – autobiographical memory	2
Development of autobiographical memory in childhood	3
Theories of autobiographical memory in childhood	4
What characterizes a traumatic event?	5
Current theories of trauma memory, and dissociation	6
Trauma and memory in preschool and school-aged children	11
The concept of dissociation	15
Child maltreatment, memory, and dissociation	17
Present study	19
Method	20
Ethical considerations and informed consents	20
Design	22
Participants	22
Measures	23
Procedure	28
Confidentiality	29
Results	30
Discussion	36
Effect of age on memory amount and accuracy	36
The relation between stress and memory amount	38
The relation between stress and memory accuracy	39
Dissociation and memory for the separation	40
Associations between short-term memory and dissociation	43
Limitations and challenges	43
Preliminary conclusions	46
References	48
Appendix A Sequential schema for observation	
Appendix B Child Memory Interview 1	

Introduction

“I know that Lisa and Torgeir from the Child Protective Services picked you up and you moved here. I wasn’t there, so I would like you to tell me everything that you remember from the day that they came and you moved here.” Miriam, 6 years answers: “The police came to our house, where I used to live. Mummy cried. I didn’t want to move. Mummy was looking, my sister playing computer games. They just picked me up. They said I ought to come to this place (a stand-by home). Then we sat in the car. The CPS took my clothes and brought it here (silence). We should move.”

The researcher observed the girl having strong reactions when the CPS explained to her what was going to happen. She seemed frightened and said: “But I can’t move, I can’t move”, “mummy will not allow me to move”, and “I’m not allowed to speak to you in the CPS”. The girl was difficult for the CPS workers to get in touch with, seeming to be in a daze, her eyes were kind of disappearing, she closed them and it was like she fainted.

Traumatic events, such as the experience this child describes, raise important questions about memory for trauma at different levels; at a societal level (e.g., witness testimony, mental health perspective); at an individual level (e.g., the experience of memory gaps, and flashbacks), and; at a theoretical level (e.g., what influences the encoding and retrieval of stressful and traumatic events may have on memory). Every day, children experience being removed from their parents by the Child Protective Services (CPS). It is important to gain knowledge about how the procedures for these removals may be improved, how the individual child’s memory for the event is shaped and further developed, and whether or not there are unique influences on memories for traumatic events such as dissociation. Will Miriam in the example above be able to recall this day the following months? What will be remembered for later recall, and will the child’s memories get influenced if symptoms of dissociation are present during or shortly after removal? It has been a huge debate about whether traumatic experiences in childhood can be repressed or lost, or whether special memory mechanisms such as dissociation supersede normal memory processes in a way that make memories of the event inaccessible for an extended period of time (Goodman et al., 2003). This thesis has a cognitive developmental approach using an experimental design to study the trauma of separation and replacement of preschool and school-aged children. It is a pre-study in an extensive longitudinal project. As far as known, experimental studies of a real life separation has never been conducted on this group of children before.

In the following sections, the focus will be on how children experience and remember being removed from home by the Norwegian CPS and placed in a suitable care facility. These children have a history of maltreatment and/or severe abuse in addition to the experience of being separated from their biological parents. Children with a history of trauma and maltreatment (e.g., psychological abuse, physical abuse, sexual abuse, neglect, and substance abuse) represent an especially vulnerable group. It is important to gain more knowledge about how this group perceives being removed from home, including if their memory for the situation is impaired, enhanced, or if their memory for the traumatic

separation may predict later psychological functioning. Trauma and the stress associated with it are thought to have a variety of effects on memory for traumatic events themselves as well as for basic memory processes (Howe, Toth, & Cicchetti, 2006b). Children are thought to be especially prone entering temporary dissociative states to cope with intense stress or trauma (Putnam, 1997).

Dissociation, the disruptions of normal integration of memories, perception, and identity into a coherent sense of self, has profound implications for young children's memory for traumatic experiences and is therefore of particular interest for trauma researchers, cognitive scientists and clinicians (Cordón, Pipe, Sayfan, Melinder, & Goodman, 2004; Macfie, Cicchetti, & Toth, 2001). Before discussing factors influencing memory for traumatic events and if, and how, dissociative processes may affect such memories, a description of the memory system, particularly autobiographical memory, and theories on trauma memory including dissociative processes, is provided.

Memory systems – autobiographical memory

Memory theories include two main distinctions, characterizing memory by retention time giving us sensory, short-term and long-term memory, or by their content giving that different types of information can be retained in partially or wholly distinct memory systems departing (Gazzaniga, Ivry, & Mangun, 2002). Long-term memory systems are usually described as divided in explicit (declarative) memory referring to knowledge we have conscious access to, and implicit (non-declarative) memory referring to procedural knowledge such as motor and cognitive skills. Explicit memory can further be divided into episodic and semantic memory, a distinction introduced by Endel Tulving (1972). Memory for events in one's personal past occurring in a specific time and place having sensory recollections associated make up the autobiographical (episodic) memory (Nelson & Fivush, 2004). According to Tulving (1985), episodic memory depends on the ability to mentally travel back in time, and with the term "autonoetic" Tulving referred to the special kind of consciousness that allows humans to be aware of subjective time when an event took place. In contrast, semantic memories reflect the person's world knowledge such as language and facts (Gazzaniga et al., 2002). The distinction between episodic and semantic memory, has been supported by research using fMRI technology observing increased activity on both sides of the frontal lobes when using the episodic memory, in contrast to a single side activity when performing semantic memory tasks. These findings support the existence of two different neurological systems in long-term memory explicit division (Tulving, 2002). However, autobiographical and semantic memories draw on each other e.g., making an assimilation of the autobiographical memory according to the semantic knowledge of the world. In this way, experiences are linked with earlier knowledge and both subsystems might be adjusted (Nelson & Fivush, 2004).

The process of memory consists of three major hypothetical stages: encoding, storage and

retaining. Encoding refers to the processing of incoming information to be stored, happening through the registration of input in sensory buffers and sensory analysis stages (acquisition) and the creation of a stronger representation over time (consolidation) resulting in storage of the memory (Gazzaniga et al., 2002). Encoding is affected by multiple factors, such as the child's earlier experiences and prior knowledge of the world (Cordón, 2002, cited in Cordón et al., 2004), which, in turn, affects how an event is interpreted and understood. During early childhood extensive developmental achievements are reached, thus expected to affect the memory reports given. What information being encoded depends on cognitive processes like attention directed by selection and concentration within the limit of its capacity (Gazzaniga et al., 2002). For memories to be explicitly available for recall later, they must be integrated and consolidated (Bauer, 2007).

Development of autobiographical memory in childhood

Events experienced before the age of about 18 months are found not to be accessible verbally, while for the age span 18 months to 2.5 – 3 years children are able to provide coherent reports of events but in a brief, fragmentary fashion and prone to increasing error over time (Bauer, 2004; Fivush, 1998).

Experiences that are not available for explicit recall in childhood are seldom found to be a part of adult autobiographical memory (Cordón et al., 2004). Concerning what is known as infantile amnesia, theories are many. One suggests that memories are formed before age 2, but later become inaccessible as a result of cognitive changes, e.g., the onset of language (Bauer, 2004). Other theories point out the development of the “cognitive self” enabling children from around 2 years of age to process events like something that happened to “me” (Howe, Courage, & Edison, 2003), and starting to form autobiographical memories. Thus, the inaccessibility of early memories, traumatic or otherwise, is suggestively explained in terms of cognitive, neurological, linguistic, and social factors (Bauer, 2007; Cordón et al., 2004; Howe et al., 2006b).

By about 3 years, children start talking about past events more independently from adult scaffolding, and begin to use the story or narrative form in these conversational interactions (Howe et al., 2003). Individual differences exist, but from this age and with gradually more sophisticated language, memories can be retained and organized around a life history including concepts of time and place (Fivush, 1998; Howe et al., 2003). Research studies have included children in an age range enfolding infants and early childhood, e.g., Howe et al. (1994). Children ranging in age from 18 months to 5 years were interviewed about their memories for emergency room experiences following injuries such as fractures, lacerations, and severe burns. The interviews were conducted a few days after the event and again 6 months later. Children younger than 30 months at the time of injury and hospital visit recalled little at either interview, whereas the children older than 30 months were able to report their

experiences at both interviews (Cordón et al, 2004; Howe et al., 1994). This illustrates when the ability to verbally recall a personal relevant event occurs.

Memory develops according to other aspects of neurological, cognitive structures and linguistic ability, making memory more effective with age given the child's increase in world knowledge and consciousness about personal mental processes. For example, children's ability to code sources of information, the achievement of better language, and a repertoire of acquisition and organization strategies (Howe, Cicchetti, & Toth, 2006a). The principles of memory development are mainly derived from research on non-traumatized children recalling pleasant events like visits to a museum or shopping mall, or trips to amusement parks (Howe, Cicchetti, Toth, & Cerrito, 2004), but complementary research on traumatized children has increased, especially regarding childhood sexual abuse, giving raise to theory development on childhood memory. There has been considerable debate about when episodic memory is first available (Goodman & Melinder, 2007a) and how it emerges through childhood.

Theories of autobiographical memory in childhood

Different models of autobiographical memory development exist (Goodman & Melinder, 2007a; Nelson & Fivush, 2004). Howe and colleagues suggested a model focusing the development of a sense of self, which they term "the cognitive self" (Howe et al., 1994). The cognitive self appears around the age of 2 years, making the child able to organize information and experiences as something personal happening to "me", recognizing it self as part of the event. This is suggested to contribute to the gradual ending of infantile amnesia as the child starts making a cognitive self-schema (Goodman & Melinder, 2007a). Disturbance in the development may happen, as that of delayed maturation (e.g., due to Down syndrome, familial mental retardation). These children acquire a cognitive self if, and when, they achieve a mental age comparable to that of non-delayed infants (around the age of 2 years) (Howe et al., 2006b). Not found to be affected by child maltreatment, the onset of cognitive self seems to be linked to maturation-constitutional factors in a higher degree than social-experiential factors (Howe et al., 2006b). Other theorists agree that the development of "a sense of self" is an important factor in the development of verbally accessible memories, not conflicting with the view of sociolinguistics adding an emphasize on language and narrative skills as well (Goodman & Melinder, 2007a; Nelson & Fivush, 2004).

Nelson and Fivush (2004) point out that these components operate within cultural and social contexts, where maternal elaboration of the child's autobiographical experiences together with the child, called adult memory talk, is playing a particularly important role. Typically, the parents start to talk to their child about everyday life events as the child

develops a sense of self, coincidental with the child's language comprehension and expression development exploding in the middle of the second year. This developmental stage is seen as especially important as it fosters sequential thinking and temporal organization (Nelson & Fivush, 2004). Differencing from Howe et al. (2006b) introducing the development of "the cognitive self" as the break point of autobiographical memories, Nelson and Fivush (2004) promote a slowly development of the formation toward an adult autobiographical memory from the general beginning around 3 or 4 years of age, with only a few memories from each year until school age. In addition, sociolinguists emphasize the child-parent relationship in the maternal reminiscence style, but without concern of the value of this relation.

Goodman and Melinder (2007a) suggest, in light of the highly agreed upon importance of sense of self in the development of autobiographical memory and the role of maternal elaboration, that both the parent's and the child's attachment orientation influence the development of autobiographical memory. The model postulates that attachment relations play a central role in the cognitive and verbal processing of events in the childhood, especially negative experiences as it is thought to elicit attachment behavior for survival reasons. Children's own attachment orientation linked to affect regulatory processes, and parental attachment style affecting if and how parents help children to talk and think about the negative experiences, boosting the processing (Goodman & Melinder, 2007a). The model further proposes that enduring autobiographical memories are likely acquired between the 2nd and the 4th year of age as a function of brain maturation, influenced by socio-emotional and cognitive environment (Goodman & Melinder, 2007a).

Relating the above models and debates of autobiographical memory to the present study, further writing will be concerned with memory development once it is possible to form an enduring autobiographical memory. Young children (3 to 6 years of age) are expected to report less information about the trauma according to both the theories above.

Before describing current theories and knowledge in the field of memory for traumatic events in maltreated and non-maltreated children, a definition of trauma is demanded.

What characterizes a traumatic event?

What constitutes a traumatic experience is lacking a clear definition in the literature existing. According to DSM-IV-TR, trauma involves witnessing, experiencing or being confronted with "actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others" (American Psychiatric Association (APA), 2000, p. 463). The exposure leads to a response involving intense fear, helplessness, or horror, which in children can be

expressed by disorganized or agitated behavior (APA, 2000). Trauma has been variously described, e.g., as an experience that: (1) threatens the health or wellbeing of an individual (Brewin, Dalgleish, & Joseph, 1996); (2) indicates that the world is an uncontrollable and unpredictable place (Foa, Zinbarg, & Rothbaum, 1992); and, is an inescapably stressful event that overwhelms an individual's coping mechanisms (van der Kolk & Fisler, 1995). The child's world knowledge and earlier experiences affect how the child understands and interprets events, mundane as well as traumatic, contributing extensively to whether the child perceive and experience the event as traumatic (Cordón et al., 2004; Pipe & Salmon, 2001). In contrast to the ICD-10 defining traumatic experiences in objective term, the stressor definition in DSM-IV-TR includes a subjective component including descriptions of suspected responses to the trauma (APA, 2000; Diseth, 2005; WHO, 1992). This component acknowledges that the personal reaction plays a crucial role (Salmon & Bryant, 2002). Another perspective taken to conceptualize trauma, is to what degree these events (such as child abuse, sexual assault) involve social betrayals. A growing body of research demonstrates that events high in betrayal are associated with significant distress, as would be expected if these events were traumatic by the more common use of the term (Freyd, DePrince, & Gleaves, 2007).

Which situations children experience as traumatic compared to stressful or painful, differs across subjects, but a forced removal from home may be a traumatic experience (Leslie et al., 2000). The separation from their family and loss of their parents may contribute to undermine the children's sense of belonging and even further impair their presumed already battered sense of self-esteem (Davidson-Arad, Englechin-Segal, & Wozner, 2003). A feeling of fear and helplessness can be expected in children being removed from home, like Miriam saying she does not want to move, knowing that the CPS decides independently of what she or her mother say. Miriam cannot escape the situation. Many removals also happen acute, and for planned ones the child is not always informed or just partly informed about the removal, giving an unpredictable aspect to the situation.

Current theories of trauma memory, and dissociation

As one of the early theorists of dissociation in the present, Putnam (1997) proposed that dissociative behavior and trauma-related symptoms are associated to the severity and persistence of the trauma. Psychological traumas occurring early in life, affects the child's opportunity to follow a normal developmental trajectory affecting basic conditions like the attachment system (Nijenhuis, van der Hart, & Steele, 2006). Theories concerning

dissociation differ in their perspective, e.g., whether dissociation is the mechanism behind recall failure, or if dissociation provides a potential explanation of memory phenomena linked to PTSD or autobiographical memory in general. For the purpose of the present thesis, three theories representing the width of theoretical thinking on this field are presented.

Betrayal trauma theory (BTT). Taking a survival perspective on children experiencing traumas from their caregivers, Freyd developed betrayal trauma theory positing that children remain unaware of caregiver-perpetrated abuse because this allows them to maintain the vital attachment to their caregivers (Freyd, 1996). Betrayal trauma occurs when the people or institutions on which a child (or adult) depends for survival violate that person in a significant way. Examples of betrayal trauma are childhood physical, emotional, and sexual abuse perpetrated by a caregiver. Children who grow up in abusive homes develop divided attention skills that help them keep threatening information out of awareness, that is, they develop the means to ignore the abuse (i.e., dissociative abilities) (Becker-Blease, Freyd, & Pears, 2004b). Specifically, the theory proposes that the way in which events are processed and remembered will be related to the degree to which a negative event represents a betrayal by a trusted, needed other (Freyd et al., 2007). Theorists within this approach have proposed that memory impairment for trauma-related information involves avoidant processing, e.g., people may fail to encode the material (vs. impaired retrieval processes, e.g., McNally et al., 2005). DePrince and Freyd (2004) tested college students, some reporting childhood sexual abuse (CSA), under divided attention conditions. They found that students scoring high on a dissociation questionnaire exhibited memory deficits for trauma words (e.g., incest) when these were viewed under divided attention conditions. In addition, high dissociators reported significantly more trauma history and betrayal trauma (i.e., abuse by caregiver) than students low on dissociation. The results support BTT predicting that adult survivors of sexual abuse who were molested by their caretakers are especially likely to dissociate their memories of abuse.

However, traumatic events tend to be remembered and may even be better remembered (Cordón et al., 2004; Fivush, McDermott Sales, Goldberg, Bahrick, & Parker, 2004). One study replicating DePrince and Freyd's procedure did not find support for the betrayal trauma theory. McNally and colleagues (2005) utilized the divided attention paradigm in testing for memory deficits for trauma words relative to neutral words in adults reporting either continuous or recovered memories of CSA versus adults denying a history of CSA (McNally, Ristuccia, & Perlman, 2005). Memory deficit for trauma words under divided attention was expected in the recovered-memory group, but the results were found to be inconsistent with this prediction, as all three groups exhibited better recall of trauma words

than neutral words, irrespective of encoding conditions (McNally et al., 2005). There is an ongoing debate between the two approaches. Goodman and colleagues (2003) found no relationship between abuser status (parent/caregiver vs. stranger) and failure to report abuse years after the abuse in a sample of 175 young adults who had participated in criminal proceedings related to sexual abuse allegations approximately 10 years earlier. Thus, as for most, if not all, survivors of trauma, little support has been found for the notion that trauma experiences are not encoded resulting in amnesia (Howe et al., 2006b). In the current study, no measures or tasks according to divided attention was included.

The next theory described makes a distinction between explicit (verbal) and implicit (non-verbal) memories, consistent with distinctions in basic memory system theory (Gazzaniga et al., 2002), and suggests that there is no encoding of explicit memories during a trauma, however implicit memories are encoded and preserved.

Van der Kolk's theory. The starting point for this theory is that traumatizing occurs when the individual's internal and external resources are both inadequate to cope with an external threat. According to van der Kolk (van der Kolk, 1994; van der Kolk & Fisler, 1995) mental traces after traumatic experiences are qualitatively different than memories of mundane events. The suggestion is that trauma interferes with explicit but not with implicit memory because trauma leads to the release of stress hormones, hormones that create a sort of state-dependent memory for the traumatic experience (van der Kolk & Fisler, 1995; van der Kolk, Hopper, & Osterman, 2001). These state-dependent memories are, according to van der Kolk, inaccessible to conscious recollection until the same state is induced again and the traumatized start to talk about the sensations, remaining intact and unchanged until that happens (Howe et al., 2006b; van der Kolk et al., 2001). Research conducted by van der Kolk and Fisler (1995) during provocations of traumatic memories, found that a lowered activity in the language area during re-experience of trauma causes the failure of encoding explicit memories of the event, leaving more primitive organizations of the experience e.g., visual pictures and somatic sensations (van der Kolk, 1994; van der Kolk & Fisler, 1995). In another study van der Kolk and colleagues have found that traumatic memories, especially those associated with PTSD, initially lack narrative elements. This was found in a study of 16 adults with and without current PTSD who had experienced awakening from general anesthesia during surgery (van der Kolk et al., 2001). Using the Traumatic Memory Inventory to assess the way memory for traumatic events are organized and retrieved at three time-delays, they found that participants with PTSD were more likely to report that they did not have a narrative memory initially, and had a higher degree of reliving of sensations and affects (van der Kolk et al., 2001). Observations from the clinic experiencing traumatized patients having trouble verbalizing their feelings support this theory (van der Kolk et al., 2001). Unlike explicit

memories, implicit memories are said to appear spontaneously in the guise of dreams, flashbacks, body sensations, avoidant behavior, and so forth (Nijenhuis et al., 2006). Thus, van der Kolk postulates that traumatic events initially are encoded as sensations or feeling states, and later once people start to talk about these sensations trying to make meaning of them or relive them, the memories are transcribed into narratives (explicit memories) (van der Kolk et al., 2001).

Research have found that stress actually aids the consolidation of memories for traumatic events and persist more accurately than for mundane events (see e.g., Peterson & Whalen, 2001). One study found that higher degree of stress during trauma was associated with better memory and giving more information about the traumatic incident. This was in a study of children's long-term memory for the hurricane Andrew (Fivush et al., 2004). Fivush and colleagues interviewed 3-4 year old children experiencing the natural disaster within a few months after the trauma, and again 6 years later when they were 9-10 years old. Children were grouped according to level of severity of the experience giving high, moderate or low degree of stress (e.g., at home when their family's house fell apart, experiencing flooded basements and trees knocked down, or no storm, just heavy rainfall). Findings showed that all children reported the event vividly at both delays (Fivush et al., 2004). Howe et al. (2006b) agree with van der Kolk that extreme levels of stress can impair consolidation of an event, but comment that even if trauma resulted in state-dependent memory that could not be consciously accessed, evidence has not supported that individuals become amnesic for the experience. Individuals can report dissociative alterations in consciousness like slowing of time and "out of body"-experiences, but can still provide declarative recollections (Howe et al., 2006b). Van der Kolk's suggestion that implicit memories remain intact until the same state is induced has not been supported by research so far (Howe et al., 2006b).

Implicit, like explicit, memories are found to be subject to change and distortion. Not many studies have included implicit memory for traumas in their assessment though, but in a study conducted by Goodman and colleagues (1997), children were first asked to recall verbally their experience from the painful medical procedure VCUG and then re-enact it with dolls and props (e.g., an anatomical doll, catheter tube). In this study, reporting of the main event was greatly facilitated by all age groups (Goodman, Quas, Batterman-Faunce, Riddlesburger, & Kuhn, 1997).

Van der Kolk's theory is similar to the Betrayal Trauma Theory (BTT) in that it suggests a total failure to encode traumatic experiences verbally, but as BTT suggests that the failure involves memory per se, van der Kolk's theory postulates that traumatic memories are encoded implicitly. Another perspective on trauma and memory is the network theories

suggesting that traumatic memories *are* encoded but in somewhat different ways.

Dual representation theory (DRT). According to Brewin (e.g., 2003), memory consists of two representational systems giving verbally accessible memories and situationally accessible memories. Before this multi-representational theory, Foa and colleagues were early in their suggestion of a fear network model (see e.g., Foa & Kuzak, 1986). Trying to explain findings like the notion that traumatized individuals develop a heightened sensitivity to and a heightened memory for trauma-related information (see e.g., Howe et al., 2006b), they suggested that traumatized individuals develop semantic “fear” networks that serve to organize trauma-related information. The network serves to preserve information about trauma (e.g., through rehearsal of information) and link similar experiences in memory, thus, making stronger traces (Foa & Kuzak; 1986; Reisberg, 2001). Research supporting aspects of this theory has been conducted. Individuals with documented CSA and individuals with more PTSD symptomatology have been found to have particularly accurate memories of the abuse (Alexander et al., 2005). The fear network model focuses on a single explicit format of mental representations, treating verbally accessible and non-verbally accessible information in the same way. Brewin has suggested a multirepresentational theory.

According to Brewin (e.g., 2003), the first of the two types of representations in the dual representational theory (DRT) reflects the individual’s conscious experience of the traumatic event, called verbally accessible memories (VAMs). The second type of representation consists of situationally accessible memories (SAMs). VAM representations are fully contextualized within the person’s autobiographical database including sense of present and past, while SAM representations are not. SAMs are characterized by reliving in present, fragmented sensory video “clips”, and are not in context. DRT further suggests that VAM and SAM representations are encoded in parallel at the time of the trauma and between them if repeatedly exposed (Brewin, 2003). For example, holistic, dissociative memories or flashbacks, dreams, and trauma-specific emotions would be considered to be the result of the activation of SAM representations (via cueing), whereas people’s ability to recount the trauma, for example in recollection tasks for research purposes, their answers and narratives would be a function of accessing VAM representations (Dalgleish, 2004). Every incidence of re-experience in a normal recovery process leads to some information from the SAM being copied to the VAM, making them less overwhelming to the SAM system, giving that the individual get more control over the traumatic event (Brewin, 2003). A failure of the slow but consistent copying process through e.g., deliberate avoidance, can lead traumatic memories to remain in the SAM system giving symptoms of PTSD (Brewin, 2003). Dissociation is in this theory seen as a risk factor to develop PTSD.

Empirical evidence found by the same group claimed that two types of trauma memory could be detected in parallel in the same individual. In a series of experiments designed to test the theory Holmes, Brewin, and Hennessy (2004) had participants watch a trauma film under different conditions. In one condition, they had to carry out a concurrent visuospatial task, tapping a pattern on a concealed keyboard. In another condition, they had to carry out a concurrent verbal task, counting backwards in threes. The participants then had to record in a diary the number of intrusive memories of the film they experienced over the next week. The prediction was that the visuospatial task would compete for the resources of the SAM system, leading to perceptual information being less well encoded and resulting in fewer intrusions than a no-task control condition. In contrast, the verbal task was expected to compete for the resources of the VAM system, leading to a less-detailed conscious representation and resulting in more intrusions than in the control condition. As in an earlier study (Brewin & Saunders, 2001), the concurrent visuospatial task reduced intrusive memories the following week, but Holmes et al. (2004) also showed that the verbal task increased the number of intrusions relative to a control condition. These results support the claim of DRT.

The dual representational theory has been found to be useful both as a theoretical tool for generating research and for presenting a framework for therapeutic interventions for PTSD (Dalgleish, 2004). Similar to van der Kolk's theory, the DRT build on two memory systems, but unlike van der Kolk's theory suggesting that non-accessible memories remains intact while verbal traces fail to encode, the DRT suggests a parallel encoding in situationally and verbally accessible memories. A further difference is that Brewin postulates that exposure leads to a stepwise exchange of information about the trauma moving from the SAM to the VAM making the traumatic memory gradually more accessible and contextualized.

One limitation in van der Kolk's and Brewin's theories is the lack of a developmental perspective. Freyd and colleagues focus on childhood traumas, but much of the research conducted on childhood trauma do not support the notion that traumatic memories like the one studied in this pre-study is not encoded at all. The main focus is for treatment purposes (Dalgleish, 2004), which is of major importance. However, the different models lead to different predictions according to children and their memory for traumatic events and will be used to shed light on different possibilities when discussing the results of this pre-study.

Trauma and memory in preschool and school-aged children

Are memories for distinctive, traumatic events in some way different from memories of non-traumatic, mundane events? Do the variables found to influence children's memories of

neutral or positive experiences influence memories of traumatic events as well, or are unique mechanisms affecting trauma memories? Over the last decades, extensive research have been done trying to find what factors influence children's memory for traumatic events like natural disasters, medical procedures, accidents, and injuries (see e.g., Córdón et al., 2004; Howe et al., 2006a), studies of adults and their memory for child abuse (e.g., Alexander et al., 2005; Goodman et al., 2003), and experimental studies of memory in non-maltreated and maltreated children (e.g., Becker-Blease et al., 2004b; Eisen, Qin, Goodman, & Davis, 2002). An individual factor found to affect several aspects of children's memory, is age.

Age. After the age of three, age at the time memory is encoded and assessed is found to be a reliable predictor of memory for mundane as well as stressful and traumatic events, particularly when children are asked for open-ended or narrative accounts (see e.g., Córdón et al., 2004; Fivush, 1998). Age effects are found related to the *accuracy* of memory reports and suggestibility, with younger preschool children doing more errors than older children (Eisen et al., 2002; Goodman et al., 1994; Quas et al., 1999). In one study, 189 children aged 3 to 17 years of age involved in evaluations of alleged maltreatment were interviewed during a 5-day inpatient stay with specific and misleading questions about an anogenital examination and psychological consultation. Support for an age pattern in accuracy was found, showing an increasingly smaller proportion of errors for specific questions from younger to older children (Eisen et al., 2002).

Age has further been found to be a reliable predictor of the *amount* of information children recall (e.g., Goodman, Quas, Batterman-Faunce, Riddlesburger, & Kuhn, 1994; Peterson & Whalen, 2001). Goodman et al. (1994) showed the age-effect in a study interviewing 46 children aged 3 to 10 years old within 3 weeks of an invasive medical procedure (voiding cystourethrogram fluoroscopy; VCUG) and found differences in free recall accounts. In the same vein, older children were found to report significantly more information than younger children at time delays ranging from one-week to 5 years after a traumatic injury occurring at the age of 2 to 13 years requiring treatment at an emergency facility (Peterson & Whalen, 2001). The youngest group typically reported fewer than 50% of details available at all delays, and the oldest typically reporting 80-90% (Peterson & Bell, 1996; Peterson & Whalen, 2001). Former research on maltreated children and disclosure on child abuse, confirm findings on non-maltreated children according to effects of age (Eisen et al., 2002). Empirical findings give support to the first prediction, by which an age effect is expected according to the amount of information reported by the children: Older children will report *more information* about the removal situation than younger children both shortly after

the separation from their parents and when interviewed three months later. Older children will also report *more accurately* and show better abilities to reject misleading questions compared to younger children.

Reminders. Traumatic as well as non-traumatic events can be associated with a diverse number of reminders. In the study conducted by Peterson and Whalen (2001) children were likely exposed to reminders at least by accomplishing repeated interviews about the event, providing opportunities for reactivation of the memory. For traumatic events there may be reminders such as media writings (e.g., accidents, natural disasters) and physical evidence if scars, fractions or the like following the trauma (e.g., injuries, medical procedures). In contrast, highly traumatic experiences are less likely to be talked about. For example in cases of incest, children can be told to keep the abuse a secret or the degree of taboo makes one avoid rather than raise the topic. In their review, Córdón et al. (2004) shed light on the possibility that reminders might have different effects on implicit versus explicit memories for traumatic events. In implicit memories, as reflected in emotional reactions, behavioral responses, or preferences, reminders as re-encountering the trauma context, but without the traumatic experience, may attenuate the non-verbal response. In explicit memory on the other hand, reminders may facilitate affective long-term verbal recollection (Córdón et al., 2004).

Research shows that reinstatement and reactivation, along with relatively brief reminders, can be major determinants of whether an experience is forgotten or remains accessible over time (Córdón et al., 2004). Children being removed from home will be surrounded by reminders of different kinds, some of more script like or semantic quality such as living in a new family and starting in a new kindergarten/school. Other types of reminders will be direct autobiographical, such as talking to and/or visiting their biological parents, getting questions from peers, and professionals about the event to be remembered (e.g., the removal). This is likely to enhance their memory for their situation per se, but it is uncertain whether it concerns their memory for the removal day.

Affecting at least some of the children may be the fact that a lack of knowledge at the time of trauma is found to influence the children's understanding and appraisal of traumatic events, reported to result in a less durable and detailed event representation (Salmon & Bryant, 2002). According to children being replaced in a foster home or another care facility, adults surrounding them after removal are supposed to be conscious about their experiences and the importance of the separation from their parents resulting in a high degree of dialogue about the experience that may counterbalance the lack of understanding (Goodman & Melinder, 2007a; Nelson & Fivush, 2004).

Degree of stress. Traumatic experiences, especially the core of the event to be remembered, generally appear to be better recalled over longer delays than is typically the case for other experiences (Berntsen, 2002), perhaps because of their distinctiveness or salience (Alexander et al., 2005; Howe et al., 2006b). For highly negative experiences, information directly related to the cause of the stress is prioritized in memory, with such information often retained better the greater the distress (Christianson, 1992). This relation between memory and distress is postulated to imply that increased severity of trauma results in more accurate memory for main features of the event (Alexander et al., 2005). A study with 189 children being interviewed about their traumatic injury and the following hospital treatment at different time delays, shortly after and numerous times up till 5 years after the incidence, found at least two interesting results according to the estimated stress in the situation and the delay of memories (Peterson & Bell, 1996; Peterson & Whalen, 2001). When children were interviewed at the 6-month-delay they reported significantly less information than at the interview shortly after the injury and hospital event (Peterson & Bell, 1996). At later time-delays Peterson and Whalen (2001) found a decrease in memory over time for peripheral information and memories of the treatment at the emergency facility, but a strikingly similar amount of retrieved information of the injury itself between the 6-months delay and 5-year delay.

In the study of young children's long-term recall of the hurricane Andrew according to how much stress the children were exposed to, Fivush and colleagues (2004) found that the children experiencing moderate degree of stress reported the most when interviewed within a few months after the trauma, but after 6 years all three groups reported more than the first time and they reported the same amount of information. The only difference was that the highly stressed children needed more questions and prompts than children in the other stress groups (Fivush et al., 2004). Overall, childhood traumatic events are found to be subject to forgetting, as are non-traumatic events, but the durability and accessibility of traumatic events may exceed that of neutral and positive events (Cordón et al., 2004), and degree of stress may play an important role.

Experimental studies of adults with PTSD, a disorder characterized by painful recalls, avoidance behavior, and hyperarousal (Copeland, Keeler, Angold, & Costello, 2007), have found a highly accurate long-term memory for the trauma (Alexander et al., 2005). In their prospective study of 94 adult victims of CSA with legal experience resulting, Alexander and colleagues (2005) examined the memory accuracy and errors 12 and 21 years after the abuse ended. The result showed a positive association between accuracy of memory for the trauma

and having severe PTSD symptomatology, also showing better memory for trauma related words and less oblivion for these (Alexander et al., 2005). Although few studies have been conducted with children, it has been found that for maltreated children age 3 to 17 years, PTSD symptoms were associated with more commission errors, but were additionally associated more correct recall (Eisen et al., 2002). However, others have found no differences in memory performance between children with and without PTSD, leaving an assumption of un-relatedness between PTSD and memory performance in children (Howe et al., 2006a). In this pre-study the relation between having PTSD symptomatology and memory performance is possible to explore, and a logical assumption is to find a positive correlation between PTSD symptoms and the amount of correct information and more commission errors given.

Based on the above reviewed research, children experiencing a high level of stress are expected to remember the same amount of information about the removal day, or more, after three months compared to after one week. According to correctness in what is recalled and reported, children experiencing a high degree of stress are predicted to remember more correct information and less incorrect than those experiencing a low degree of stress.

Not until recently has focus been given to potential effects different kinds of child maltreatment may have on children's cognitive development (Howe et al., 2006a). So far, factors that have been discussed are the individual factor age and factors characterizing the experience, the traumatic situation. In addition, there are factors found to have an effect on memory that are also found to be more evident among maltreated than non-maltreated children. For example, psychopathology, lower scores on intelligence measures, lower short-term memory capacity (Eisen et al., 2002), and low socio-economic status (SES) (Howe et al., 2004). Experiencing maltreatment in childhood makes children more vulnerable for using dissociation as a coping strategy and the chance for dissociation developing to be the dominant strategy used (Cholankeril et al., 2007; van der Kolk et al., 2001). Research on maltreated children, dissociation, and memory have found some association with the factors found to be more evident among maltreated children that will be discussed after looking at challenges in the conceptualization of dissociation.

The concept of dissociation

The concept of dissociation and its potential protective character has been known since Pierre Janet described women with hysteria in the late 19th century (Janet, 1907/1920), but is still a phenomenon surrounded by controversy and skepticism. Dissociation protects the individual in the face of an overwhelming trauma, and may enable a child to mentally avoid an ongoing trauma he or she cannot physically avoid; dissociation helps the person cope with severe trauma (Cordón et al., 2004; Diseth,

2005). Definitions of dissociation in the literature are diverse, including, “a disruption of usually integrated functions of consciousness, memory, identity, or perception” (APA, 2000, p. 519); a severe deficit in the integration of the self (Macfie, Cicchetti, & Toth, 2001); and, a failure to integrate memories of an event leaving them less accessible to conscious recollection through the formation of isolated memories (Cordón et al., 2004). Central to most definitions of dissociation is a significant change in normal consciousness or awareness that arises from reduced or altered access to one’s thoughts, feelings, perceptions and/or memories (Briere, Weathers, & Runtz, 2005). Behavior observed in children thought to be reflect dissociation includes the child appearing as withdrawn, like “in a daze”, interpersonally non-responsive, and inattentive. Some are significantly involved in fantasies about themselves and others (Briere, 2005; Macfie et al., 2001). Dissociative defences may be conceptualized as performing three major tasks: automatization of behavior, compartmentalization of painful memories and affects, and estrangement from self, facing potential death or destruction (Putnam, 1997).

Today, two ways of understanding and classifying dissociation exist: a dimensional approach and a categorical approach (Diseth, 2005). Within a dimensional approach, dissociation can be conceptualized as a complex psychological process occurring at a continuum ranging from a wanted kind of minor normative dissociation (e.g., deep concentration, daydreaming), to severe psychopathological conditions (e.g., dissociative identity disorder). Thus, between these two extremes is a continuum where every degree of dissociation may occur (Nijenhuis et al., 2006). This mental strategy becomes pathological when it leads to functional loss or altered behavior (Diseth, 2005). A categorical approach is represented in the classification systems. In ICD-10 dissociation is described in relation to one main category, dissociative (conversion) disorders with eleven subcategories describing mainly altered consciousness (WHO, 1992), not including loss of sensation (e.g., pain), classifying those as somatoform symptoms (Diseth, 2005). DSM-IV-TR includes five diagnoses under the classification of dissociative disorders: Dissociative amnesia, dissociative fugue, dissociative identity disorder, depersonalization disorder, and dissociative disorder not otherwise specified (APA, 2000). Another perspective described by several authors is the distinction of dissociation in different levels related to the severity of dividedness during the dissociative experience: primary dissociation refers to a dividedness between the normal personal state and the traumatic personal state, a division of the trauma; secondary dissociation refers to a dividedness within the traumatic state between the observing and the experiencing part of the self; and, tertiary dissociation refers to a dividedness in the person’s identity in the trauma aftermath when adapting to daily life (Benum, 2006).

The specificity of the term dissociation has been affected by problems of both over-

and under-inclusiveness (Nijenhuis et al., 2006). Definitional issues are important to both theory-building and empirical investigations. Delineating and clarifying definitional issues, such as the continuum vs. categorical classification, and whether dissociation is premised to be protective or pathological in nature, is of critical importance for assessment, data interpretation, and theory building (DePrince & Cromer, 2006).

All children show some degree of dissociation, with younger children being more reliant on this mechanism to cope with stress than older children (Putnam, 1997). Highly dissociative children may be at risk for developing a chronic feeling of depersonalization and derealization, resulting in memories that seem to have a dream-like quality (Cordón et al., 2004). The presence of dissociation in many young children, like having imaginary friends (Putnam, 1997), complicates the distinction between normative and trauma induced dissociation and complicates the study of dissociation in children.

Child maltreatment, memory, and dissociation

Child maltreatment is found to be a factor in dissociation in preschool-aged children as it is in older children and in adults (Macfie et al., 2001), but controversy exists regarding the impact of maltreatment-related sequel on basic memory processes (see e.g. Eisen et al., 2002; Howe et al., 2006a; Howe et al., 2004). Most studies of maltreatment are conducted on adults reporting on their childhood abuse retrospectively, only a few exists on children identified by the child protective services or other child treatment institutions.

In introducing a caretaker report measure of children's trauma- and abuse-related symptoms, Briere and colleagues (2001) administered the Trauma Symptom Checklist for Young Children (TSCYC) to a clinical sample of 190 children aged 3 to 12 years old who had at history of maltreatment (Briere, 2001). The children were recruited through child advocacy centers, abuse programs or child trauma centers throughout the United States. The subscale dissociation was found to strongly predict exposure to physical abuse (Briere et al., 2001), indicating that children experiencing physical abuse are particularly prone to rely on dissociation to cope. Other studies have found high dissociation in physically abused preschool-aged children (Macfie et al., 2001), and dissociation associated with any kind of maltreatment but with a distinct difference between the experience of sexual abuse displaying high levels of post-traumatic symptoms and physically abused tending to use dissociation as a primary coping mechanism (Cholankeril et al., 2007). Dissociation subscale is found to predict symptom severity in children with PTSD (Sim et al., 2005). Recent studies have looked at maltreatment, memory and dissociation or PTS symptoms more explicit. What do

these studies tell us?

Attention. One aspect of research on dissociation is the suggested association between divided attention and keeping traumatic memories out of awareness (DePrince & Freyd, 2004). In one study researchers used focused and divided attention memory tasks to assess to what degree 198 low SES abused (with low or high dissociation scores) versus non-abused (with low or high dissociation scores) preschool children aged 4 and 5 years differed in remembering charged and neutral pictures presented. Results were found to be consistent with the idea that traumatized people may use divided attention to keep threatening information out of awareness (i.e., betrayal trauma theory), data showing that abused children with high dissociation score remembered fewer charged pictures relative to non-abused children (Becker-Blease et al., 2004b). Contrary to the prediction that dissociation is associated with the use of divided attention was the reported similarity between abused children with high and low dissociation score on memory tasks for charged and neutral pictures (Becker-Blease et al., 2004b). The results are consistent with adult studies, in that maltreated children may develop divided attention skills that facilitate coping of stress and trauma. According to these findings, the assumption is that high scores on dissociation lead to less correct information recalled, even if the findings are mixed whether dissociation is a significant factor according to recall (Becker-Blease et al., 2004b).

Dissociation is associated with trauma and often described as a posttraumatic response (e.g., Putnam, 1997). More recent research has started to look at memory processes related to attention that are relevant to PTSD. For example, individual differences in working memory capacity (i.e., the ability to hold and manipulate material in focal attention) appear to be related to the ability to prevent unwanted material from intruding and negatively affecting task performance (Brewin & Holmes, 2003). Brewin and colleagues have in their research found that healthy individuals with greater short-term memory capacity are better at suppressing unwanted thoughts when instructed to do so under experimental conditions, whether these thoughts are neutral or obsessional in nature (cited in Brewin & Holmes, 2003). These findings may help explain why low intelligence, which is strongly related to working memory capacity, is a risk factor for PTSD (Brewin, Andrews, & Valentine, 2000). In the study conducted by Eisen and colleagues (2002), maltreated children aged 3 to 17 years, were interviewed about a traumatic medical experience and a psychological consultation. The results indicated that both short-term memory (STM) and intellectual ability predicted facets of memory performance. More specifically, STM was significantly associated with memory for the psychological consultation; and, predicted children's overall memory for the

anogenital examination. In general, children with greater STM spans also performed better on the event memory task (Eisen et al., 2002). In sum, this study found dissociation to be related to better, not worse, memory in children. Based on Eisen et al. (2002) and reasoning on the theoretical implications from PTSD research (Howe et al., 2006a), a positive relation was predicted to emerge between STM capacity and dissociation in the present study.

Multiple risk factors. Multiple risk factors like low SES, disturbed family and social relations, parental psychopathology, and substance abuse are known to be present in many maltreated children's life (Cholankeril et al, 2007; Howe et al., 2004). In Norway, there have been large descriptive studies conducted earlier on children in the child protective services that are placed in foster care (Havik, 2004). These studies have reported that maltreated children do not adapt, emotionally and socially, as well as children not being placed in foster care. Long-term exposure to abuse and neglect sets the stage for an increased need of medical, correctional, social and mental health services as the child grows older (van der Kolk, 2005). Research on PTSD generates knowledge about dissociation as a phenomenon and as a post-traumatic response. One study looking at the statistical association between trauma exposure and dissociative symptoms in a normative sample (n = 618) using the Multiscale Dissociation Inventory, revealed significant dissociative symptoms in only 8% of trauma-exposed individuals from the general population (Briere, 2006). But, 90% of those with at least one clinically significant dissociation-scale on the inventory used, reported a trauma history, and significant dissociation was found in only 2% of individuals not reporting a trauma history. Statistics was suggested to indicate that trauma is an important, but insufficient, condition for the development of dissociative symptomatology. Instead, additional risk factors like high posttraumatic stress and/or reduced affect regulation capacities may determine whether trauma exposure results in clinically significant dissociation (Briere, 2006). The relation between memory, dissociation and maltreatment is thus characterized by complexity.

Present study

From about age 3 years on, children are found to give reasonably coherent accounts of past experiences, especially of novel situations (Fivush, 1998). DSM-IV gives a notion about being aware of not confusing dissociative amnesia with developmentally appropriate childhood amnesia, i.e., the decrease in recall of autobiographical events occurring before the age of 5 (APA, 2000). The children included in this study are removed from home, experiencing being separated from their biological parents. What situations are experienced as traumatic, and the degree of stress experienced, differs among children, but in this study being separated from the primary caregiver and replaced by the CPS is defined as a traumatic experience.

In Norway, the Government by the child protective services (CPS) is responsible for providing

children who experience lack of sufficient care from their parents' necessary care at the right time, including temporary orders in acute situations and care orders for an extended period. Children can be placed in a foster home, institution or another suitable day care facility with biological parents' consent or with force. According to the Child Welfare Act (CWA) an acute removal can be accomplished according to section 4-4, paragraph 5 and section 4-6. A planned removal can be accomplished according to the CWA section 4-4, paragraph 5 or section 4-12. Removal is a severe intervention in a child's and a family's life. The main purpose of the CWA is to provide help in the child's best interest, and it is important to get more knowledge regarding the methods the Government applies in these situations. It is of political, practical and theoretical interest to learn more about the methods and how the children themselves experience, understand and feel about the intervention.

From the introduction outlined above several predictions were advanced. First, age was predicted to correlate positively to the amount and accuracy of information given in the memory interviews. Second, children rated as experiencing a high degree of stress, were predicted to recall the same amount of information, or more, after three months compared to after one week. Third, children experiencing a high degree of stress were predicted to remember more correct information and less incorrect than children experiencing a low degree of stress. Fourth, children experiencing peri-traumatic dissociation and/or with high scores on dissociation and/or PTS total were predicted to recall more than children with low scores. Finally, STM capacity was predicted to correlate positively with degree of dissociation.

Method

Ethical considerations and informed consents

Because this study challenged the established rule for informed consent, a brief reflection and description of the necessary steps is first provided, followed by a presentation of the design and finally the traditional disposition for participants, materials, and procedures.

Ethical considerations. With the permission from the Ministry of Children and Equality, the Regional Committee for Medical Research Ethics, the Board for Confidentiality and Research, and the Data Inspectorate we thus investigated several issues related to children ages 3-12 years, being removed from their primary caretakers by the CPS. For the planned removals, informed consent was obtained from the biological parents before the actual day of removal according to established rules. But for the acute removals, getting an informed consent before or in the actual situation was problematic. Conducting research in stressful, acute situations demands thorough considerations. The biological parents were often in

conflict with the CPS when an acute removal was accomplished, reacting with overly cooperativeness or withdrawal and hostility. For example, asking for consent via the CPS could have led parents to give their consent as part of their cooperative attitude, regarding the research project to be in the interest of the CPS. For the acute removals a researcher, with experience from similar situations, participated presenting herself as a researcher from the university being there to observe and register what happened. The parents were told that they and/or their lawyer would be contacted for further information. Vulnerable children were involved, and a removal often involves one or more unknown adults to the child in the situation and at the new residential home. The researcher having a withdrawn neutral position during the removal was essential not to burden the child and family additionally. Ethical considerations have been weighted, and the importance of getting insight into these situations and the knowledge gained were found to be superior, letting a researcher attend without having the parents' consent.

Informed consent. For the planned removals, informed consent was obtained from the biological parents before the day of removal as described. If one of the parents had parental responsibility but took no part in the care, the relevance of contacting him/her was considered in each case. The caregiver could have another relation to the child, e.g., grandparent, aunt or uncle, but was accounted to be a significant attachment figure for the child. Still the biological parents with parental responsibility for the child would give consent to participation in the project.

For the acute removals, the Ministry of Child and Equality gave the project responsible Dr. Annika Melinder and two of her staff members, Ragnhild Klingenberg Stokke and Gunn Astrid Baugerud an exception from getting informed consent before or in the removal situation. This allowed the three named researchers to attend the removal and observe what took place, and then contact the biological parents and/or their lawyer shortly after the removal day to get their informed consent. If the parents did not want to participate, the information obtained was maculated.

For each step of the research the participants were informed about the aim and the procedure for the project. The biological parents gave an informed consent according to the general rules (e.g., the Helsinki declaration) and the children gave their assent to participation. Research involving vulnerable children and adolescents require that the researcher ask the child about his/her opinion (Fisher, 2004). The procedure of consent was a continuous process characterized by an explanation of the research project to the participant in consent-relevant

terms appropriate to the participant's language preferences (e.g., dialect) and proficiencies, as well as developmental level. This ensured valid consents to an optimum.

Design

The main study, of which the present thesis is part of, is outlined as an experimental study within a cognitive developmental perspective. Specifically, the study composes to a 2 (removal condition; acute removal vs. planned removal) x 3 (interview/observation; one week after the removal vs. three months after vs. one year) mixed factorial design. Control over the experimental situation is obtained through the presence of a researcher during the removals.

This pre-study did not include data from the one-year follow-up. Further, it had a special focus on dissociation as a mechanism in memory for traumatic experiences and limits the report to these main areas of interest. Of course, several other measures were also collected, such as caregiver attachment style, and the child's expressive language ability.

Participants

Children and their families were recruited through cooperation with the CPS in three counties in Norway (i.e., Oslo, Akershus, and Buskerud), which include 15 municipalities. The CPS informed the researcher team about current cases of acute removal according to the Child Welfare Act (CWA) §§ 4-4, 5.paragraph, 4-6, 1., or 2.paragraph, and cases of planned removal according to the CWA § 4-4, 5.paragraph or cases being prepared for the count committees for social affairs according to the CWA § 4-12. The main project will include 72 children divided in the acute ($n = 36$) and planned ($n = 36$) removal conditions. In the present study, 12 children ($n = 12$; 5 boys and 7 girls), aged 40-141 months at removal day ($M = 89.8$, $SD = 34.0$) are included. At the one-week follow-up data are complete for all participants, but due to one family withdrawing their consent as their child moved back home with the parents and one child being removed for less than three months ago, interview and test data have been collected for 10 children at the three-month follow-up. The participants were recruited from urban and rural areas. The researcher attending the removal can only focus on one child at a time, thus in sibling removals a selection procedure have been employed following this order: In families with two children within the target group, the youngest/oldest child was included every other time. In families with more than two siblings within the target group, the oldest was included in case 1, the one in the middle in case 2, and the youngest in case 3 (cases being separate removals). If there was an even number of siblings in families where we were going to follow the child in mid position, we estimated the mean age and chose the child

being closest to this age. Parental consent was obtained as described. 5 out of 12 removals were planned, and informed consent was obtained prior to participation in 6 out of 12 cases (the sixth being planned by the biological mother and the CPS, but being acute for the child and caregiver at the time of replacement). The main reason for the CPS to undertake the removals, was sexual abuse ($n=2$), physical abuse ($n=1$), emotional abuse ($n=3$), neglect ($n=4$) and parent drug abuse/psychiatry ($n=2$) according the CPS case reports. None of the children had experienced a removal conducted by the CPS earlier.

Measures

Sequential schema for observation. A detailed sequential step-by-step schema for observation was outlined according to the procedure in removal situations (Appendix A). This is based on the text in the CWA, guidelines given by the Ministry and own-experience among the researchers from working for years in the CPS. The removal procedure was divided in seven phases. Phases included are; when the CPS arrives where the child is; conversations where information is given to the child/parents; the packing; arrival at the new care facility; conversation where information is given to the new caregivers; and, the time when the parents and/or the CPS depart. What happens and who are present in these phases are registered. In addition, the affective, verbal and physical state of the child, biological parents and significant others present are registered. To register the person's affective state in each phase, valence dimensions are differentiated in checklist form in the schema. The affective expressions to be observed are based on Ekman's six primary emotions (i.e., disgust, fear, anger, surprise, sadness, and contempt) (Ekman, 1973, 1992), labeled from 1 – 5 (not present – to a strong degree). Degree of stress in the child is graded from calm to excitement on a five-point scale based on observations of behavioral signs such as body positioning, looking movement and gaze, and style of speech (Cassidy & Marvin, 1992). The registration of verbal state includes verbal expressions, degree of acceptance, aggression and verbal resistance, all graded from 1 – 5 (not present – to a strong degree). Degree of aggression, flight reaction, physical resistance and withdrawal/apathy, all graded from 1 – 5 (not present – to a strong degree) are registrations made to measure physical acts/handling strategies. When coding the affective, verbal and physical state in addition to the degree of stress, the grade in each category for each phase is summed up individually and divided on the number of phases relevant for each child's removal. This gives a mean index number for each child in each category, range 1-5.

The same researcher attained all removal situations, scoring the observation schema. Because it was not possible to video tape the removal situations, and as part of strengthening

the reliability of the rating, the researcher scoring the observation schema has seen videos with children from a health check situation and the film *Kramer vs. Kramer* with focus on the scenes involving child- parent interactions (i.e., separation sequences) together with the researcher doing the follow-ups, scoring and discussing the different categories in the schema. This contributed to strengthen the reliability in an optimal way even if intrapersonal change of how to view different expressions and acts in the removal situation relative to the experiences with such extraordinary situations cannot be out-ruled (Pedhazur & Schmelkin, 1991).

Measuring the presence of peri-traumatic dissociation, meaning dissociative symptoms occurring in the course of the traumatic experience itself (Brewin & Holmes, 2003), is based on behavioral features described to be evident in clinical settings as well as in a diagnostic study of diagnosed dissociative children (Silberg, 1998). These features are appearance of seeming to be in a daze, fearful reactions, acting like in a trance, and being difficult to get in touch with because he/she seem to be in his/her own world.

Memory interviews. A structured memory interview was used across all subjects (i.e., children, parents, and caseworkers) to make comparisons possible (Appendix B). After introductory questions, the interview started with a general open-ended question about the removal day followed by three prompts to obtain additional narrative detail, before direct recall questions were asked about the removal step-by-step including questions about emotional reactions, speech, clothing, persons present, and procedure at the removal day. False-memory questions such as "Did the child protective service bring a dog?" (Ghetti, Qin, & Goodman, 2002; Melinder & Gilstrap, 2007; Melinder, Sculling, Gravvold, & Iversen, 2007), and specific attachment style related questions concerning for example to what degree parents prepared the child for removal, are included (Quas et al., 1999). The interview guides for each time-delay (here: one-week (T1) and three-month (T2)) are identical for all respondents. One exception was non-relevant questions, which were not asked. For example, if the parents did not come along to the new care facility, the questions about this event are not asked in the parent interview. The interviews were outlined in cooperation with experienced researchers within the field of child witness' and memory research.

In the process of making the memory interviews functional for the age range 3 – 12 years, a pilot was conducted on 4 non-maltreated children (3, 4, 8, and 10 years old) who had experienced an event approximately one week earlier. After adjustment to the non-maltreated children's comments and reports, the interview guide was employed throughout the pre-study.

The same researcher, and different from the researcher attending the removal day, conducted the child interviews at both time delays. The switch of researcher was to avoid a

potential reminder effect from the removal situation and secure that the interviewer was blind to the event interviewing about. The interviews were taped and later transcribed before coding. Only child interviews were coded and analyzed in this pre-study. Questions about issues relevant for the time after removal day and the specific attachment style related questions are not included in this pre-study (questions 60-62 and 65-73).

Coding memory interviews; children's answers. Interviewers questions about the day of removal were coded into 3 question types: (1) open-ended questions ($n = 4$) (e.g., "I know that ___ and ___ from the Child Protective Services picked you up and you moved here. I wasn't there, so I would like you to tell me everything that YOU remember from the day that they came and you moved here"); (2) direct questions ($n = 54$) (e.g., "Who was with you when ___ and ___ (CPS) came?"); and, (3) false memory questions ($n = 4$) (e.g., "Did the CPS workers bring a dog when they picked you up?") were scored. All information provided by the children in the open-ended questions was scored as units of information (Alexander et al., 2002; Melinder, 2004). The situations that are asked about are highly diverse, so special care for coding was taken. Two categories for each of the conditions correct and incorrect were scored; "Hit", "Correct rejection", "Commission" (i.e., to add information not relevant to the day of removal), and "Omission" (i.e., to exclude information). "Don't know" and "Unverifiable" responses were counted according to units of information but taken out of the material before further analysis. "Unscoreable" was given special scores and taken out. Proportions of "Hits" and "Correct rejections", and "Commissions" and "Omissions" were created for each child for the question categories open-ended, direct and false memory questions. The false memory category was not included in the pre-study due to the small sample and relatively few questions ($n = 4$).

Reliability was established between two coders using the scoring of the first five child interviews to reach a common understanding of the concepts for scoring units of information due to four categories of correct and incorrect units of information, plus "don't know" and "unverifiable". Thereafter the two researchers independently scored 6 transcribed protocols out of 22 (27, 3%) with gender and age representation mirroring the participants and matched according to time delay T1 and T2, corresponding to $n = 348$ child responses. A 90% agreement was attained. Disagreement was resolved, and each researcher then coded half of the remaining interviews.

Trauma Symptom Checklist for Young Children (TSCYC). The TSCYC is a 90-item caretaker-report instrument developed for the assessment of trauma-related symptoms in children ages 3 – 12 (Briere, 2005; Briere et al., 2001). It contains two separate scales to

ascertain the validity of caretaker reports: response level and atypical response of the child's symptoms (Briere, 2005). The TSCYC contains eight clinical scales: anxiety, depression, anger/aggression; sexual concerns, dissociation, and three posttraumatic symptom-scales subdivided in intrusion, avoidance and arousal, summed up in a posttraumatic stress scale (PTS total). Each validity and clinical scale consists of nine items. Items are rated on a 4-point scale, ranging from 1 (not at all) to 4 (very often). Raw scores are transformed to standardized *t*-scores ($M = 50$, $SD = 10$). For the clinical scales *t*-scores in the range 65 to 69 indicate problematic functioning at a sub-clinical level and *t*-scores at or above 70 indicate a clinical significance. The validity scale assessing response level to reflect whether the caretaker denies behaviors, thoughts, or feelings in the child, have *t*-score cutoffs similar to the clinical scales: *t*-scores in the range 65 to 69 suggesting under endorsement, and *t*-scores at or above 70 suggested to be considered invalid. The scale assessing if atypical responses are given, meaning a high level of the most uncommon TSCYC symptoms like "worrying that his or her food was poisoned" has a invalidity cutoff at *t*-score 90 (Briere, 2005).

For the purpose of this research paper, the PTS total and dissociation subscales are included in analyses. PTS total was included due to its relevance for the dissociation phenomenon. The subscale dissociation was focused. The items tapping dissociation is for example, "living in a fantasy world", "seeming to be in a daze", and "staring off into space". The scale taps detachment, internal absorption, fantasy and daydreaming, trance-like phenomena, and other potential symptoms of dissociation in the child (Briere, 2005). Psychometric properties of the TSCYC are well documented (Becker-Blease et al., 2004b; Briere et al., 2001; Finkelhor, Ormrod, & Turner, 2007; Gilbert, 2004) The TSCYC is standardized on a stratified North American sample, and has separate norms for males and females in three age groups: 3 – 4 years, 5 – 9 years, and 10 – 12 years. Studies using the TSCYC have shown good to excellent internal consistency for the clinical scales, for example, reported Briere and colleagues (2001) scale alphas ranging from .81 to .93 with an average scale alpha of .87 in samples of abused children. Another study reported an average scale alpha of .86 (Gilbert, 2004). For the purpose of this study, previous research has demonstrated strong inter-correlation and concurrent validity, including correlations with the CBCL (see e.g., Briere et al., 2001; Gilbert, 2004). TSCYC has not been used and published in Norway before. The Norwegian translation was translated back by an independent person, and modifications conducted.

TSCYC forms being invalid due to high scores on response level or atypical responses, or having more than 10 blank responses when returned, were taken out before

analyzing. At the one-week follow-up 4 forms were taken out, and at the three-month follow-up 4 forms were left out in addition to two not obtained. For one participant the TSCYC was invalid at both times.

Child Behavioral Checklist Ages 1.5-5 and Ages 6-18 (CBCL/1,5-5 and CBCL 6-18). The CBCL (Achenbach, 1991; Achenbach & Rescorla 2000, 2001) is a widely used behavior rating scale in Norway as well as in other countries. The CBCL/1,5-5 having 100 items and the CBCL/6-18 having 113 items where behaviors are rated by the caregiver on a 3-point scale (0 = not at all true, 1 = somewhat true, 2 = very true), and raw scores are transformed to standardized *t*-scores ($M = 50$, $SD = 10$). The checklists generate scales for a wide variety of functioning areas. The syndrome scales (e.g., withdrawn and aggressive behavior) and DSM-oriented scales generated give raw scores and *t*-scores. A *t*-score in the range 60 to 65 indicate problematic functioning at a sub-clinical level, and *t*-scores of 66 and above at a clinical level in the given area. The generated scales Internalization, Externalization and Total Problems consist of several syndrome scales, and *t*-scores in the range 60 to 63 indicate sub-clinical level and *t*-scores of 64 and above indicate a clinical level of problematic functioning (Achenbach & Rescorla, 2000, 2001). Norwegian norms are used when scoring. The scales Total Problems, Internalization and Externalization problems are used in the pre-study.

Several researchers have been exploring the possibility to assess dissociation using the CBCL /4-16, as it is a widely used behavior rating scale (Cholankeril et al., 2007). Malinosky-Rummel and Hoier (cited in Becker-Blease et al., 2004a), published a CBCL subscale of dissociation consisting of item 1 (acts to young for his/her age), 8 (can't concentrate, can't pay attention for long), 13 (confused or seems to be in a fog), 17 (daydreams or gets lost in his/her thoughts), 80 (stares blankly), and 87 (sudden changes in mood or feeling) in the form CBCL/4-16 (Achenbach, 1991), corresponding perfectly with the form CBCL/6-18. In a separate study of abused and non-abused preschool children, this CBCL dissociation scale was correlated with the dissociation subscale for TSCYC ($r = .67$) (Becker, Pears, & Freyd, 2001). For the CBCL/1.5-5, item 2 (correspond to (=) item 1), 5 (= item 8), 77 (= item 80), 79 and 82 (= item 87) are recognized from the published dissociation subscale. As the purpose in this pre-study was to estimate the correlations between subscales for validity purposes, the 5-item subscale in CBCL/1.5-5 was used. Further, TSCYC forms being invalid due to high scores on response level suggesting an over endorsement, was *not* taken out before running the correlation since the estimated subscale on the CBCL build on the caretaker's response to the same items without being evaluated according to validity in the scale it self. Due to more than 10 missing responses at the TSCYC form at the one-week

follow-up, two were taken out because of being invalid. Thus, using Pearson product-moment correlation coefficients the relation between the dissociation subscales of TSCYC and CBCL was estimated to potentially strengthen the construct validity of the dissociation subscale in TSCYC as it has not been used with Norwegian children previously while the CBCL forms have Norwegian norm. Based on raw scores for both the TSCYC and CBCL subscales the analysis for the one-week follow-up found no significant correlation, $r = .27, n = 9$; thus a strong correlation for the three-month follow-up, $r = .86, n = 9, p < .003$. The mixed result pointing out the importance of comparing these two subscales further in the main study. Given the positive correlation at both times, one being significant, indications to use the TSCYC for research purposes at a Norwegian sample despite North-American norms are promising.

Wechsler tests. The youngest children, aged 3 to 5, are given the subtest Sentences in the Wechsler Pre-School and Primary Scale of Intelligence, revised (WPPSI – R) (Wechsler, 1989). The older children, aged 6 to 12, are given the subtest Digit span in the Wechsler Intelligence Scale for Children, third edition (WISC-III) (Wechsler, 1991). WPPSI-R Sentences and WISC-III Digit Span have a widely respected validity and reliability as a measure for short-term memory. The internal consistency reliability across age groups of the Sentences is estimated at 0.95 and Digit Span is estimated at 0.88. In the scaled scores, the mean is 10 and the standard deviation is 3. The middle half of these standard scores falls between 8 and 12 (Sonnander, Ramund, & Smedler, 1999; Tideman & Ramund, 1999; Wechsler, 1989, 1991).

Procedure

In this section the procedure for the full study with the time delays one week and three months is presented, leaving out non-relevant measures and the one-year follow-up. Sampling procedure differing for the two conditions (i.e., planned and acute removals) are highlighted before the common procedure for both conditions is described.

First contact with the family and until removal is followed through. For the planned removals, the CPS asked biological parents for permission to give us contact information. The parents were contacted and an informed consent was obtained before the actual day of removal. Information was given the researcher as a decision from the county committees for social affairs existed and date for removal was set. Researcher A attained during the removal from the CPS arrived at the family/met the child, until the child was situated in a suitable daycare facility. The researcher filled out the sequential schema for observation.

For the acute removals, the CPS contacted researcher A when an acute removal came up, giving the time and place to meet. Researcher A accompanied the CPS to where the child was, or met them there, participating until removal was conducted and the child was situated in a suitable daycare facility. The researcher filled out the sequential schema for observation. Shortly after the removal day, researcher A contacted the biological parents to obtain informed consent for participating.

In this pre-study the children in both conditions are seen as one group, sharing the experience of being removed from their home and thereby separated from their parents or primary caregiver.

One-week follow-up. One week after the removal, researcher B visited the child at its current localization. The child's primary caregiver filled out an age appropriate CBCL (Achenbach & Rescorla, 2000, 2001), and the TSCYC (Briere, 2005; Briere et al., 2001). The researcher asked for the child's assent. The child was interviewed about what he/she remembered of the removal day, and asked to tell about "here-and-now" using the memory interview. Biological parents were contacted in the same time period, asked to fill out an age-appropriate CBCL thinking of the child's functioning before removal, in addition to conducting the memory interview.

Three-month follow-up. Three months after the removal, biological parents were asked to consent, and interviewed with the memory interview. Researcher B visited the child at its current care facilitation. The child's primary caregiver filled out an age appropriate CBCL (Achenbach & Rescorla, 2000, 2001), and the TSCYC (Briere, 2005; Briere et al., 2001). The researcher asked for the child's assent. The child was interviewed about what he/she remembered of the removal day, and asked to tell about "here-and-now" using the memory interview. The child was given the short-term memory test (Wechsler, 1989,1991).

During the first three months after removal, the responsible caseworker in the CPS was contacted. A researcher, not researcher A, interviewed the caseworker present at the day of removal. Additionally the child's case-record was looked through to obtain information like reports of concern, earlier assistance given, earlier removals, and demographic information about the child and its parents. Reasons for the present removal were registered.

Confidentiality

All information was given a serial number only accessible for the project leader and co-workers. Data about each child and family are coded, and the material was made anonymous.

Data are used for statistical purposes and the material cannot be traced to the individual participant.

Results

To examine the predictions, different statistical procedures have been employed such as the Pearson product-moment correlation coefficient, one-way between-groups analysis of variance (ANOVA), and paired sample t-tests. Due to a limited number of participants the children are seen as one group according to age except from in one analysis (i.e., when exploring the impact of age on the accuracy of information given in the memory interviews), in which the participants were divided in two groups according to age; 40 to 83 months of age, and 84 to 141 months of age. The cutpoint corresponded to the median split and provided two groups of approximately the same size, corresponding to younger and older children. The age range of the sample is wide, 3 to 12 years-old, but as can be seen in Table 1, all participants have reported information from the removal day at both time delays.

Table 1

Descriptive information: Participants and materials

Gender	Age	Total Units of information		CBCL Total problem <i>t</i> -score	TSCYC		Stress Index Range 1-5	Short-term memory Wechsler score
		1week raw sc.	3mths raw sc.		Diss.	PTS tot <i>t</i> -score		
Boy	40	91	118	46	61	54	1.80	3,0
Girl	48	95	161	34	44	57	2.80	9,0
Girl†	59	191	234	54	83a	52	3.00	6,0
Girl†	68	158	441	45	62	65b	2.40	7,0
Boy	70	102	123	45	43	46	3.20	8,0
Boy	89	145	188	54	43	48	3.10	8,0
Girl	92	332	451	55	43	42	3.40	12,0
Boy	95	269	250	71a			3.70	8,0
Girl	116	281	431	37	43	52	3.60	5,0
Girl°	124	131	104	69a	48	51	2.50	6,0
Boy	136	303	-	-	-	-	3.80	-
Girl	141	377	-	61b	46	61	3.00	-

<i>M</i>	89.8	206.25	250.10	51.70	51.60	52.80	3.03	7.20
<i>SD</i>	34.0	101.07	140.05	12.10	13.25	6.88	0.59	2.44

Note. TSCYC dissociation and PTS total: For girl 59 months-old and girl 92 months-old the *t*-scores for the three-month follow-up are presented due to respectively invalid score at the response level scale ($t = 72$) and >10 blank at the one-week follow-up. For boy 95 months-old the score is invalid due to >10 blank.

° Girl 124 months-old has a moderate mental retardation functioning at the level of a 4 year old.

† Presence of peri-traumatic dissociation.

a Clinical range; b Sub-clinical range.

Data will be reported for the six dependent measures, presented in Table 1. The CBCL, the TSCYC, and PTS total are presented with *t*-scores from the one-week follow-up (T1) to give an indication of the children's level of functioning. Looking at the CBCL at T1, three of the children had high *t*-scores, two in the clinical range and one sub-clinically. None of the youngest children had high scores on CBCL. Correlating the CBCL Total problem at T1 and T2 showed a significant correlation, $r = .81$, $n = 9$, $p < .01$, indicating high consistency. Analyses of correlation conducted between units of information and each of the CBCL internalization, externalization, and total problem scales revealed no significant relations and are not further described in the result section.

Scores on the TSCYC reveal a clinical level of dissociation in one of the youngest children, and a score in the clinical range for one young child at the subscale PTS total. There were no significant correlations between neither the dissociation subscale at T1 and T2, nor the PTS total subscales at T1 and T2. The stress index revealed a moderate degree of stress during the removal situation. Cognitive measures for short-term memory revealed a somewhat lowered short-term memory capacity in general. Specifically, the youngest child had a score more than two standard deviations below the mean of the Wechsler scaled scores ($M = 10$, $SD = 3$). The association between short-term memory capacity and dissociation will be explored at group level.

Units of information are reported as the total number of responses each child gave during the memory interview at T1 and T2. The memory interview included open-ended, direct, and false-memory questions. Table 2 presents the proportions of the response categories hit, correct rejection, commission, and omission according to the children's total units of information.

Table 2

Proportions of Units of Information in the main categories for each type of questions

Type of question	Open-ended questions <i>n</i> = 4		Direct questions <i>n</i> = 50		False-memory questions <i>n</i> = 4	
	One-week <i>n</i> = 12	Three-months <i>n</i> = 10	One-week <i>n</i> = 12	Three-months <i>n</i> = 10	One-week <i>n</i> = 12	Three-month <i>n</i> = 10
Type of information	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Hit	14.83 (9.74)	12.33 (9.15)	65.13 (10.66)	66.44 (10.90)		
Correct rejection			7.99 (3.77)	6.52 (5.14)	1.84 (1.31)	1.28 (1.15)
Commission	.12 (.41)	.58 (1.48)	6.80 (5.93)	9.79 (10.22)	.05 (.18)	.29 (.54)
Omission			3.23 (2.87)	2.78 (1.75)		

Prediction (1): Age was predicted to be positively correlated with the amount and accuracy of information given in the memory interviews. The relationship between the amount of information (as measured by Total Units of Information) and the age of the participants in months was investigated using correlation analysis at T1 and T2. Despite the small sample, there was a significant positive correlation between the two variables total units of information and age at T1, $r = .72$, $n = 12$, $p < .01$. At T2 there was no significant association between age and amount of information reported. Thus, older children did remember more than younger children one week after the situation to be remembered, but this difference had evened out at the three-month follow-up.

The relationships between the accuracy of information (as measured by correct vs. incorrect units of information in proportion of total units of information) and the age of the participants in months was also investigated using correlation analysis at T1 and T2. Results showed that there was a significant positive correlation between the two variables correct information and age at T1, $r = .74$, $n = 12$, $p < .01$. For incorrect information and age at T1 there was, not surprisingly, a significant association between a decreasing proportion of incorrect information reported and an increasing age, $r = -.81$, $n = 12$, $p < .001$. These results support the predicted age-amount and accuracy relation, meaning that older children report more information on the memory interview, and give more correct information than do younger children after one week delay. In regard to longer delay, i.e., three months, no significant association was found for the predicted age-amount and accuracy relation.

To further understand the relationship between age and the different categories of information, type of information reported was analyzed in regard to correct responses (i.e., hit and correct rejection), and into incorrect responses (i.e., commission and omission errors). These new dependent measures were entered into separate one-way ANOVAs for the T1 interview, using the median split ages groups as the between grouping factor. Because the T2 interview did not evince any significant correlations, there was no support for conducting an analyses of variance. Table 3 shows the descriptive statistics for these variables.

The results evinced a significant difference for age in the three categories at T1; hit, $F(1, 10) = 5.96$, $p < .04$ $\eta^2 = .37$, correct rejection, $F(1, 10) = 8.44$, $p < .02$ $\eta^2 = .46$, and omission, $F(1, 10) = 5.02$, $p < .05$ $\eta^2 = .33$, but none for the commission errors. According to the mean scores in each age group for these categories, an increase in hit and a decrease in leaving information out (omission) are associated with increasing age. This partly supports the prediction of an age effect in accuracy of information (e.g., hits), but partly it contrasts the

assumption (e.g., omissions). Contrary to prediction, results evince that the youngest children have more correct rejections of misleading questions than the older.

Table 3
Proportions of Hit and Correct rejection (correct), and Commission and Omission (incorrect) responses according to age

Proportion	Age group 3-6 years		Age group 7-12 years	
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)
Type of information				
<i>All questions after 1 week, T1</i>	<i>n</i> = 5		<i>n</i> = 7	
Hit*	.71	(.14)	.85	(.06)
Correct rejection*	.13	(.05)	.08	(.02)
Commission	.11	(.07)	.05	(.04)
Omission*	.05	(.03)	.02	(.01)
<i>All questions after 3 months, T2</i>	<i>n</i> = 5		<i>n</i> = 5 ^a	
Hit	.73	(.14)	.84	(.09)
Correct rejection	.09	(.06)	.07	(.05)
Commission	.15	(.14)	.06	(.04)
Omission	.03	(.02)	.03	(.03)

Note. The direction of the difference between age groups is decided by comparing mean scores of proportions.

^a Because of one family withdrawing their consent, and one removal conducted less than 3 months ago.

* $p < .05$. Planned comparisons revealed a significant difference between the 3-6-year group and the 7-12-year group.

Prediction (2): Children rated as experiencing a high degree of stress, were predicted to recall the same amount of information, or more, after three months compared to after one week. The first step in evaluating the prediction was to explore the difference in amount of information given at the two time delays using a paired sample test for each category variable for units of information.

Table 4
Comparing the amount of information given at the one-week and the three- month follow-up

	One-week follow-up T1		Three-month follow-up T2		Sig.
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	
Total units of information^a	179.50	(86.08)	250.10	(140.05)	.039

^a Total units of information is reported in raw score, i.e., the mean total number of units of information the children reported at each of the memory interviews. Due to 10 participants at T2, the *M* (*SD*) at T1 differs from the number reported in Table 1 according to two missing cases in the analysis.

The analysis showed a significant difference between the T1 and T2 memory interview in total units of information given, $t(9) = -2.41, p < .04, \eta^2 = .39$. According to the mean at T1 and at T2 shown in Table 3, we concluded an increasing effect on the amount of information provided of delay. There were no significant differences found between T1 and T2 when the main categories correct units of information, that is the sum of hit and correct rejection, and incorrect units of information, that is the sum of commission and omission errors, were analyzed.

To further evaluate what affect the degree of stress in the encoding situation has on the total amount of information (according the categories total units of information, correct information, and, incorrect information) reported when interviewed about the removal; a one-way ANOVA was conducted for each of the two test-times (i.e., T1 and T2). Subjects were grouped in low and high degree of stress with a cutoff at 3.1 corresponding to the median of the stress index. No statistically significant difference was detected in the mean scores of units of information total amount; correct information; incorrect information across the two groups. Thus, the expected association between high degree of stress (as opposed to low degree of stress) during the removal and reporting more information at the latest time delay T2 compared to T1 was not computed in these analyses.

Prediction (3): Children experiencing a high degree of stress were predicted to remember more correct information and less incorrect than those experiencing a low degree of stress. The relationships between the accuracy of information (as measured by correct units of information vs. incorrect units of information in proportion of total units of information) and the degree of stress (range from 1 = very little to 5 = very much) were investigated using correlational analyses.

Table 5

Correlation between Proportions of Units of Information reported and Degree of Stress during Removal

Units of Information		Degree of stress (range 1 – 5)
Total correct 1 week	$M = 87.17 (SD = 9.82)$	$r = .60^*$
Total incorrect 1 week	$M = 10.11 (SD = 8.42)$	$r = -.66^*$
Total correct 3 months	$M = 85.28 (SD = 12.25)$	$r = .69^*$
Total incorrect 3 months	$M = 13.16 (SD = 11.54)$	$r = -.66^*$

*Correlation is significant at the .05 level (2-tailed)

As Table 5 shows, significant positive correlations were found for correct units of information given in the memory interview and degree of stress during the removal after one week (T1), $r = .60$, $n = 12$, $p < .04$, and after three months (T2), $r = .69$, $n = 10$, $p < .03$, indicating that a higher degree of stress seems to enhance memory accuracy both shortly after the trauma and after several months. This is further mirrored by the findings of significant negative correlations between the degree of stress and incorrect units information given at T1, $r = .66$, $n = 12$, $p < .02$, and at T2, $r = .66$, $n = 10$, $p < .04$. Thus, the results are in accordance with the prediction that children experiencing a high degree of stress remember more correct information and less incorrect information than children experiencing a low degree of stress.

Prediction (4): Children experiencing peri-traumatic dissociation and/or with high scores on dissociation and/or PTS total are predicted to recall more than children with low scores. To explore the relationship between dissociation/posttraumatic stress symptomatology, and memory at T1 and T2, correlation analyses were used. However, invalid caretaker reports about trauma symptoms limited the number of valid protocols for analyses, and thus the final value of analyses conducted. Table 1 presents the means and standard deviations for relevant dependent measures; dissociation, PTS total, and units of information. Although only 5 protocols were valid, the degree of PTS total and total units of information reported at T2 showed a significant correlation, $r = .93$, $n = 5$, $p < .02$. No other significant relations were found, but an interesting trend was observable in the material: According to accuracy, a high degree of dissociation tended to correlate slightly with lower degree of correct information; T1, $r = -.36$, $n = 7$; T2, $r = -.22$, $n = 5$, and higher degree of incorrect information; T1, $r = .48$, $n = 7$; T2, $r = .19$, $n = 5$, at the memory interviews. This is contradictory to the enhancing effect dissociation was suggested to have on memory. Interestingly according to the relation reported between stress and memory for the situation, correlating degree of stress during the removal and dissociation shortly after showed a significant negative relation between the two factors, $r = -.87$, $n = 7$, $p < .05$.

Prediction (5): Short-term memory capacity was predicted to correlate positively with degree of dissociation. The association between STM capacity and degree of dissociation was also investigated, and in contrast to the predicted positive correlation, a moderate negative correlation was found for both time delays, although non significant. At the one-week follow-up, $r = -.56$, $n = 6$, and at the three-month follow-up, $r = -.58$, $n = 5$.

Discussion

The primary focus of this pre-study was to examine if there was a relation between dissociative processes and memory for a traumatic event, and if there was, explore how dissociation affected memory. Of further interest was whether the degree of stress and the recollection of the event were associated in the sample of maltreated children covering a wide age-range. Memory was assessed through open-ended, direct, and false-memory questions.

Age was found to be a determinant of the children's ability to answer memory questions correctly shortly after the traumatic situation being removed from their biological parents. Moreover, at both time-delays degree of stress was strongly related to the ability to answer correctly, and to avoid giving incorrect answers by confabulating or leaving out information. A tendency for younger children to reject misleading questions more often than older children was found. Stress during removal and dissociation symptomatology as measured shortly after the situation was negatively related. Tendencies regarding the impact of dissociation and posttraumatic symptomatology on memory were mixed. Dissociation was not found to have an enhancing effect on memory recalled in this sample, but there was a moderate negative tendency in amount and accuracy of information given. Dissociation was negatively related to stress, and the children's short-term memory capacity were tending to be negatively related to dissociation. However, posttraumatic stress symptomatology was found to be a factor due to amount of information remembered at the three-month follow-up, while psychopathology according to the main indexes internalization and externalization problems and the child's total picture of problematic functioning were not found to relate to memory performance or to dissociation. Some of these aspects of memory theory have been found consistently throughout the last decades (e.g., effects of age), while other aspects are surrounded by diverse findings and controversy (e.g., dissociation). The tendencies found are now discussed in light of previous research and current theories.

Effect of age on memory amount and accuracy

The first prediction sought to find support for earlier findings of an age effect according to amount and accuracy in the information reported (e.g., Eisen et al., 2002; Goodman et al., 1994; Peterson & Whalen, 2001). The prediction was partially confirmed. Regarding the amount of information reported, the older children did report significantly more information at the one-week follow-up, but no association was confirmed at the late follow-up. Though, the analysis was conducted on a small sample ($n = 10$) and awareness of Type I error is

demanded, that is, not to reject the predicted relationship between age and the amount of information children give as it might be present in the population despite the missing support found in this sample (Judd, Smith, & Kidder, 1991). Theories of autobiographical memory and development also supports this notion as memory gets more effective with age whether it is the child's increase in word knowledge, the achievement of better language, or a better repertoire of acquisition and organization strategies for example (Goodman & Melinder, 2007a; Howe et al., 2006a; Nelson & Fivush, 2004).

Regarding the relation between age and accuracy of the information reported, various results were found. At the superior level, looking at the proportion of correct vs. incorrect information given in the memory interviews one week after removal, predictions and previous research findings were confirmed (e.g., Eisen et al., 2002). About the amount of information, an effect of age was not found in the material at the three-month follow-up. However, the current sample was 10 children at the three-month-delay, those missing out were the two oldest children. Not finding support for an age effect may be due to the limitation of having so few participants. To deal with this the children were grouped in two according to age (3 to 6 years and 7 to 12 years).

The expected increasing proportion of correct information and a decrease in information left out (omission) according to age, was found in the material giving a strong association at the first time-delay. Contrasting earlier research the youngest children rejected misleading questions correctly more often than did older children. Eisen et al. (2002) found an increasingly smaller proportion of errors on specific questions as an effect of age among children aged 3 to 17 years old. Though, others *have found* that younger children do not necessarily give more incorrect information or be more prone to suggestible questions. An experimental study conducted by Brainerd, Reyna and Forrest (2002) of young children's susceptibility to a false-memory illusion within the Deese-Roediger-McDermott paradigm (cited in Brainerd et al., 2002), found an inverted age-effect as young children's level of false recall were lower than for older children, and for adults. Moreover, others have found this to be the case especially when the event is of personal relevance (Howe et al., 2004).

Findings in this pre-study indicated that there was a significant difference in the mean scores between the age groups at three out of four variables at the first interview, although the difference is absent at the three months interview. The age-groups are widely defined because of the small sample, and it will be preferable to divide the sample in three groups in the main study to be able to compare preschool-aged and schoolaged children to see

if the predicted age effect is present for traumatic memories in maltreated children. This will also ease comparisons with previous research.

The relation between stress and memory amount

The second prediction sought to find support for an enhancing effect of stress on memory. According to an earlier found tendency for children to give more information after a long time-delay than shortly after a trauma as they did in the study on the hurricane Andrew (Fivush et al., 2004), support was found regarding the increase in amount reported but not found for the degree of stress when participants were grouped in high-degree and low-degree of stress. The delay here is three months giving a short durability assessment, but still an increase is found. With contradictory results, albeit relevant for the time-aspect, Peterson and Bell (1996) found in their study of children experiencing a traumatic injury and a following hospital treatment, a decrease in amount reported when interviewing the children at the 6-month-delay compared to the first interview. Thus, an effect could be expected after a short time-delay as in our material as well. Interestingly, Peterson and colleagues found that the children interviewed reported a strikingly similar amount of information about the injury itself, but less information that could be defined as peripheral (Peterson & Whalen, 2001). Children in the current study are asked to remember aspects related to the day of the actual trauma. Information directly related to the cause of the stress (e.g., the separation from biological parents) is prioritized in memory and therefore often better retained the greater the distress (Christianson, 1992). This may explain the differing results of amount of information reported about the injury (i.e., the cause of stress) vs. the hospital treatment by the children in the studies conducted by Peterson and colleagues.

The effect of high degree of stress on memory is explained in contradictory ways (Brewin, 2003; van der Kolk, 1994). Van der Kolk (1994) suggests that the state-dependent memories encoded during high stress are inaccessible to conscious recollection until the same state is induced again. Our findings, though preliminary, do not support this theory as the children entering a dissociative state during the trauma reported correct information about the situation at both delays without being reinstated into the context where the trauma took place. The memory interviews are not conducted in a way that enhance re-experiencing of the trauma, being a potential explanation according to van der Kolk's theory, since that would be considered highly unethical regarding the children involved. Brewin (2003), on the other hand, suggests that memories of distressing events are mainly encoded in situational accessible memory representations, but that a copying process to the verbally accessible

memory representations normally will happen and gradually expand the somewhat limited explicit memory for the traumatic event (i.e., dual representational theory). The increase in amount from the one-week follow-up to the three-month follow-up is consistent with the dual representational theory. The increase in amount can also be understood within the theories of autobiographical memory, especially the fueling potential in negative events as pointed out by Goodman and Melinder (2007a) when secure adults interact in supportive dialogues with the children helping them to process their experiences. For maltreated children being replaced in a care facilitation it may take time to trust the adults and begin to establish an attachment relation to the caretakers, but the adults being with these children are assumed to be conscious about the importance of helping the children to cope.

How the memory for the removal situation is retained may also affect the amount of information recalled in the interviews. For the children in this study being removed from home; living in a new setting, having adults in their parents' place, and being interviewed as part of this study, are strong reminders of the trauma (Cordón et al., 2004). Repeated interviews enhance memory as they reinstate and reactivate memories about the removal day in line with suggestions posited by network theory (Brewin, 2003; Foa & Kuzak, 1986).

The relation between stress and memory accuracy

Regarding the effect of stress on the content of memory recalled by the children, the third prediction sought to find support for a positive relation between degree of stress and accuracy of the information given as found previously (Fivush et al., 2004). Support was found both regarding the enhancing effect on correctness of memories recalled and the decrease in incorrect information reported when looking at the children as one group. The relationship between degree of stress and information given was present at both delays. The before mentioned study of children aged 3-4 years experiencing hurricane Andrew found similar results (Fivush et al., 2004), also with a time-delay of 6 years. In this pre-study the participants are few regarding group comparisons, but in the main study it will be preferable to divide the group according to degree of stress both to get a clearer picture of who constitute the low/high stress-groups and to ease comparison with other studies.

Remembering the girl we met in the introduction, Miriam 68 months old, the fourth youngest child, she experienced peri-traumatic dissociation and had a sub-clinical level of PTS symptoms ($t = 65$). Looking at the units of information she reported one week after being removed from her parents, she had the highest proportion of correct information on open-ended questions, 29.8%, and tripled the amount of information reported at the three-month

follow-up, with a particularly high proportion correct information on direct questions asked, 78.2%. Her memory scores showed that direct questions were beneficiary to her giving correct responses at the late time-delay. This is one child, but it is interesting to notice according to the findings of Fivush et al. (2004) concerning that the group of children who experienced a high degree of stress needed more questions to report information. Here, the children had the highest correct proportion of units of information in the direct question section. Regarding confabulation errors, neither Miriam, nor the group, showed a higher proportion of commission errors at any delay being inconsistent with the prediction made. Previous research found that having PTSD symptoms were associated with more errors of commission in maltreated children aged 3 to 17 years, but also showing more correct recall (Eisen et al., 2002). In the present study the relation between PTS symptomatology and memory was present according to total units of information given not the accuracy of the content. Empirical findings are contradictory regarding the amount of commission errors, and the possibility of investigating this relation further is strengthened in the main research project.

One relevant question to ask is what type of information is enhanced by the degree of stress; central or peripheral information? Previous research has found that increased severity of trauma results in more accurate memory for the central features of the event (Christianson, 1992; Alexander et al., 2005). In this pre-study, the distinction between information defined to be central *related to the cause of stress* vs. peripheral *from the child's perspective* for the removal procedure, has not been highlighted. It would be of great interest to look at children with diverse histories of maltreatment and their memory for a traumatic real-life experience focusing on what type of information they remember shortly after the removal and with longer time-delays. For child witness psychology (see e.g., Goodman & Melinder, 2007b), the type of information children recall and report about real-life traumatic experiences is important to raise knowledge about.

Dissociation and memory for the separation

The fourth prediction was that children scoring high on dissociation was expected to have a better memory for the removal day than children scoring lower (Eisen et al., 2002). Contrary to the prediction, assessed dissociation was not positively related to children's memory. Due to invalid caretaker reports on trauma symptomatology in this pre-study, caution must be taken in interpreting the results. The tendencies show a decrease in amount and accuracy in the information given at the memory interviews being more in line with findings done by

Becker-Blease and colleagues on betrayal trauma theory (2004b). According to this theory, children growing up in abusive homes develop divided attention skills (i.e., dissociative abilities) that help them keep threatening information out of awareness by ignoring them, failing to encode memories of the event (Freyd, 1996). Results in the present study are inconsistent with this theory, showing that all children are able to recall information about the removal day and that stress even seems to have an enhancing effect on memory. Empirical studies regarding the ability of divided attention are interesting to look at for future studies.

By using the ability of divided attention children experiencing trauma and maltreatment are assumed to recall less correct information when interviewed about the event (Becker-Blease et al., 2004b). This prediction has been confirmed in abused vs. non-abused children, but the findings are mixed within the group of abused children leaving an uncertainty related to whether it is a high degree of dissociation or maybe the history of abuse leading to a decrease in memory for charged material (Becker-Blease et al., 2004b). In their study on memory and suggestibility in maltreated children, Eisen and colleagues (2002) also predicted that dissociation would be associated with memory impairment. They hypothesized that by dissociating the trauma, the effect of stress on memory would be moderated and therefore the enhancing effect of stress on memory would decrease. They found the opposite trend with children scoring higher on dissociation measures reporting more detailed memories of their abuse experience (Cordón et al., 2004; Eisen et al., 2002).

Due to few participants, a glance at a single case can be illustrative also regarding the relation between dissociation and memory. Looking at the one child, girl 59 months-old, who experienced peri-traumatic dissociation (though the stress index was moderate) and showed a clinical level of dissociation ($t = 83$) at the three-month follow-up, she showed a high proportion of correct information (i.e., hit and correct rejection) in general considered being the third youngest child. For example, the proportion of hit on direct questions after one week was one standard deviation above the group mean, 75.9, $M = 65.13$ ($SD = 10.66$); the proportion of hit on open-ended questions at the late time-delay was more than one standard deviation above the group mean, 25.2, $M = 12.33$ ($SD = 9.15$). The girls did not show more confabulation errors in the proportions of commission giving slightly less commissions than the group mean at both time-delays, T1 5.76, $M = 6.80$ ($SD = 5.93$); T2 8.55, $M = 9.79$ ($SD = 10.22$). This case example reflected memory performance more in line with the predictions finding dissociation to be related to better, not worse, memory for the event (Eisen et al., 2002), pointing out the importance of exploring the relation between dissociation and amount and type of information reported in the main study.

Several explanations are possible regarding the inconsistent findings. First, the possibility of developmental differences existing between child and adult populations both in the way dissociation is measured and evidenced as pointed out by Eisen et al. (2002). Also in the child population one can not rule out potential developmental differences as described in the conceptualization section about dissociation. This brings us to the second challenge in studying dissociation in children: measurement issues. There is no golden standard for assessing the concept of dissociation, especially not in children. Using the TSCYC, a checklist designed to tap degree of dissociation along with other trauma symptoms, and correlating the subscale with an established behavioral checklist like the CBCL, strengthens the measure in this study. One perspective lacking due to the measurement of dissociation is a self-report to get access to the children's own thoughts and feelings according to dissociative experiences. Maltreated children are a vulnerable group, and due to the recent removal experience ethical concerns have priority. Third, and probably the greatest obstacle in identifying distinctive dissociative processes in children is that most children, especially preschool-aged, show some level of imaginary involvement considered healthy (Becker-Blease et al., 2004b). Research have indicated that scores on the Child Dissociative Checklist (Putnam, 1997) for non-dissociative maltreated and non-maltreated children generally decrease from the age from 5 to 16, but remain elevated for children being diagnosed with dissociative disorders (Putnam, 1997). One implication for the present study is how to sort out children with healthy imaginative involvements from those who use dissociation as a way of coping with overwhelming stress vulnerable to become reliant on dissociation as a style of functioning in childhood as well as in adulthood (Eisen et al., 2002; van der Kolk, 2005). On the one hand, children younger than 5 years-old may be expected to show a higher level of dissociative symptoms than older children in this sample, and, on the other hand maltreated children are found to be prone to use dissociation as a coping strategy especially when sexually or physically abused (Briere et al., 2001; Cholanteril et al, 2007; Macfie et al., 2005). Considerable overlap in symptom descriptions of psychopathology in children and dissociative symptoms exists (Diseth, 2005), complicating this area further. The main study will be able to look into the relation between maltreatment, dissociation, and memory, contributing to broaden the knowledge existing.

Dissociation is related to PTSD, and one prediction sought to examine whether children with high scores on PTS symptomatology recall more than those with low scores in line with research on memory robustness in adult victims (Alexander et al., 2005). A relation between high degree of PTS symptomatology and amount of information recalled was

confirmed in the interviews after three months. According to theories on PTSD and dissociation, this result can be understood within the dual representational theory. Following from the theory, traumatic events mainly encoded as situationally accessible memories (SAM) are gradually copied to verbally accessible memories (VAM) as confronting stimuli suggestive of the traumatic situation. Because image-based memories are thought to be more detailed, a wide range of reminders will activate SAM. This process gives the person a more and more comprehensive narrative about the traumatic event making trauma memories especially detailed and robust (Brewin, 2003). More information can thereby be recalled and expressed in a memory interview when a high degree of PTS symptomatology is evident.

Associations between short-term memory and dissociation

The last prediction sought to examine whether the positive relation found between dissociation and short-term memory (STM) capacity (Eisen et al., 2002), was present in this sample. The results showed contradictory tendencies. A high degree of dissociation was found to be moderately associated with a low capacity of STM. A somewhat different line of research has found that a low STM capacity and potentially limited intellectual resources are risk factors in developing PTSD (Brewin & Holmes, 2003). The potential role of the STM both in how traumatic memories are processed and as a predictor of developing PTSD, is interesting to explore further. In the present material, the two children who experienced peri-traumatic dissociation had STM scores within normal range for their age ($-1 SD$), not giving support to either of the previous findings referred (Eisen et al., 2002; Brewin & Holmes, 2003). Being preliminary results, findings discussed in light of previous research and current theories give reason to believe that useful knowledge about maltreated children, memory and dissociation will be obtained as the study continues. In spite of that, some reflections are needed.

Limitations and challenges

Although this pre-study provides interesting preliminary findings in the research on memory in maltreated children, caveats must also be mentioned, some relevant for the pre-study and some seen as challenges relevant for the research project as a whole.

This pre-study has few participants and the aim was therefore restricted to look at preliminary tendencies. One challenge according to recruiting children and their families through the CPS has been that the case workers have forgotten to call when removals have been conducted, further the CPS have not been able to obtain consent from the biological

parents to give contact information to us due to high conflict level. This has given some extra challenges to secure a representative sample in the population of children being removed from home by the CPS in Norway. Thorough and regularly contact with the CPS offices has been necessary to prevent this and will be important in the continuing study.

In the main study the removal situation is divided in two different conditions, whether the child is being removed acute or planned. In this pre-study, children being removed are seen as one group independent of condition, sharing the experience of being removed from their home and thereby separated from their biological parents or primary caregiver. The opportunity to prepare for something traumatic is found to have a potential positive effect on children's coping of stressful events (Cordón et al., 2004; Goodman et al., 1994), making it interesting to explore similarities and differences among children being removed acute vs. planned according to their memory performance and other variables. The inclusion of two conditions strengthens the design of the main study, as analyses will be possible to run as the number of participants in the planned and acute conditions become sufficient.

A primary limitation connected to one of the main questions in this pre-study, is the many invalid reports of trauma symptoms giving restrictions to analyses of the phenomenon. In working on the data it has been clear that validity measures on the caretaker report are of great value when interpreting the results. On the positive side, Trauma Symptom Checklist for Young Children (Briere, 2005) contains two validity scales. However, on the negative side, some reflections about the many invalid forms are prohibited. According to the temporary caregivers' or foster parents' reports, a tendency to deny the child's thoughts, feelings and/or behavior or wanting to defend the child have become evident. One plausible explanation is that children living in a home environment being exposed to traumas necessitating removal conducted by the CPS arise sympathy and an eager to help with the caretakers overlooking the actual behaviors exposed. As for the report filled out by the biological parents to get an indication of the children's level of functioning before removal, the Child Behavior Checklist, no validity scale exists. These forms must be correlated with information from the CPS case record and the checklists filled out post-removal to assess the validity, as some special challenges are relevant in this particular study. For example, biological parents fighting the CPS might not want to fill out anything negative about their child and are unsure about the researcher's role. Others may over report due to e.g., their own mental illness and projecting of symptoms. Another aspect related to the functioning measures used is that maltreated children have a history of trauma and may have developed the ability to use dissociative strategies prior to the removal. Maltreatment is found to be associated with dissociation (Sim

et al., 2005). Getting a measure of trauma symptoms before removal could contribute to clear the picture, giving that the use of TSCYC as a pre-removal measure together with the CBCL should be considered. In addition, the TSCYC has validity scales giving an indication of reporting style with potential value for the evaluation of the CBCL filled out by the parents.

The co-occurring risk factors in samples of maltreated children contribute to difficulty in ascertaining exactly what may be operating to affect memory. To distinguish symptoms and mechanisms relevant for the current situation according to each child's history of maltreatment demands information from several sources, and are still difficult. But, some factors found to influence memory, like socio-economical status differences (Howe et al., 2004), disturbed family and social relations, and parental psychiatric disorders (see e.g., Eisen et al., 2002), are registered and possible to control for. Sufficiently large samples with an optimal control over potentially confounding factors may help clear the picture. Moreover, being able to distinguish pre- and post-removal symptomatology can be seen as secondary since the primary aim is to gain knowledge of how children with a history of maltreatment actually think about and remember being removed from home.

A challenge evident both in this pre-study and in the continuing study is related to conducting research on maltreated children and their families. Many of these families live an unstable life. One aspect where this becomes evident is in the missing data pre-removal because biological parents have been psychologically unstable, abusive on drugs or fleeing from the CPS and the police. Another challenge emerges in families where the child moves back home within a few weeks, especially if the conflict between the biological parents and the CPS about where the child should live is ongoing. The independent role and strict confidentiality of the researcher is not always easy to get the families to understand, these families often experiencing a very distressing and sometimes, chaotic periods in their life. The process of recruiting participants when conducting research on a marginal group of the population are challenging and pose logistic as well as ethical challenges (Howe et al., 2006b).

Research on stress and memory suggest that both storage and retrieval processes are affected by stress (Howe et al., 2006b). Within forensic psychology, research on aspects of forensic interviews of children has found that children may have difficulty with retrieval of stressful events in interview settings. The time of the first interview being conducted just one week after removal, may affect the children's memory reports due to them living in a new setting, meeting several new adults they are expected to relate to, and the fact that many arrangements may be unsettled. However, children seem to benefit from knowing the purpose

of the interview (Goodman & Melinder, 2007b). In the current study children are asked their assent. Children are further explained the impact of their participation by answering questions to help us understand more about how they experience and feel about being removed from their parents. The child participants are also explained that their responses will be used to help other children being removed from home.

Preliminary conclusions

This is a real case study with the researcher as an objective observer present during a traumatic event, giving the opportunity to focus on real world on-going traumas and have full experimental control over the situation to be tested. Previous research has been conducted on children experiencing natural disasters, accidents, or medical treatment and examination (see e.g., Córdón et al., 2004; Howe et al., 2006a), retrospective studies of adult victims of child abuse (e.g., Goodman et al., 2003), or experimental studies of memory (e.g., Becker-Blease et al., 2004b; Eisen et al., 2002). Being present in a highly traumatic situation as it happens makes this study unique, and enables us to comprehend maltreated children's memory, understanding and feelings about being separated from its biological parents, a severe intervention applied by the Government with the aim to serve the child's best interest.

The preliminary results showed expected developmental effects according to age and memory, even though not consistent. Results also revealed an interesting relationship between memory and degree of stress in the removal situation. Due to dissociative processes and potential impact on memory some tendencies were found that could be suggestively understood within previous research conducted in a field characterized by controversy. Regarding the negative relation shown in the present study between stress in the situation and dissociative symptomatology shortly after, it would be interesting to measure degree of stress during experiments within the divided-attention paradigm used by Becker-Blease and colleagues (see e.g., Becker-Blease et al., 2004b). Further, Eisen and colleagues failed to find dissociation to be related to stress arousal measured by heart rate and behavioral features during an anogenital examination in the study of children's memory for this situation. One suggestion to explain this lack of relationship was that dissociative children may not show differences in heart rate or observable behavior of stress arousal when confronted with external stressors (Eisen et al., 2002). One variable important to explore in future studies of dissociation in children, is stress reactions and expressions during peri-traumatic dissociation as this may differ from stress arousal shown under distress by children not entering a dissociative state.

The field of maltreatment, memory and dissociation is complex and much is unsettled. Conducting research on maltreated children having a history of trauma exposure and experiencing traumatic situations currently is important to understand memory mechanisms for traumatic experiences as well as mundane events. Empirical findings so far suggest that trauma exposure, acute or chronic, does *not* affect basic memory processes and memory for traumatic experiences in fundamental ways making memory in maltreated children differ significantly compared to memory in the non-maltreated child population (Howe et al., 2006b). Even if such differences is shown not exist, knowledge about unique memory mechanisms like dissociation is still in its infancy. Knowledge of similar and divergent memory processes in traumatized children can be compared to and complement knowledge of memory development in non-maltreated children.

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SEQUENTIAL SCHEMA FOR OBSERVATION ACUTE REMOVAL

§ _____

The Child Protective Service goes home to the child

Time of day _____

Where do we meet the child? _____

Persons from the CPS:	repr. A _____	gender _____	age _____	name _____
	repr. B _____	gender _____	age _____	name _____

Child:	date of birth _____	boy _____	girl _____
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Biological mother	present _____	not present _____	age _____
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Biological father	present _____	not present _____	age _____
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Other family members	present _____	not present _____	number _____
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Other people present by the time of arrival:	person A _____	gender _____
		age _____ name _____

person B _____	gender _____
	age _____ name _____

person C _____	gender _____
	age _____ name _____

person D _____	gender _____
	age _____ name _____

Police in uniform	present _____	not present _____	number _____
		gender _____	age _____

PHASE I – The Child Protective Services (CPS) arrives*The child***Affective moods/ emotions***Valence**Degree of presence*

	1. Not present	2. To a small extent	3. To some extent	4. To a moderate extent	5. To a high extent
Joy/happiness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disgust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surprise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sadness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contempt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Degree of stress - arousal**Degree of presence*

	1. Not present	2. To a small extent	3. To some extent	4. To a moderate extent	5. To a high extent
Degree of arousal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Verbal measures*Degree of presence*

	1. Not present	2. To a small extent	3. To some extent	4. To a moderate extent	5. To a high extent
Accepting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aggressive/angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verbal resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Physical measures /coping strategies*Degree of presence*

	1. Not present	2. To a small extent	3. To some extent	4. To a moderate extent	5. To a high extent
Aggressive/angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Withdrawal/lethargy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Biological mother: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies

Biological father: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies

Other person present: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies

PHASE II – The CPS talks to the biological parents

Who is present:

The child _____

Biological mother _____

Biological father _____

Siblings

1.	gender _____	age _____
2.	gender _____	age _____
3.	gender _____	age _____
4.	gender _____	age _____
5.	gender _____	age _____

Other people present _____

Information given in the conversation with the CPS:

	To a great extent	To some extent	No info
Where the child is going			
Who the child is going to live with now			
What will happen to the child's school/kindergarten/activities			
Contact with the child after the removal			
Additional information:			

During the conversation

Biological mother: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological father: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

The CPS talks to the child

Where: _____

Who is present:

Biological mother _____

Biological father _____

Siblings

1.	gender _____	age _____
2.	gender _____	age _____
3.	gender _____	age _____
4.	gender _____	age _____
5.	gender _____	age _____

Other family members

person A gender _____ age _____ connection _____

person B gender _____ age _____ connection _____

person C gender _____ age _____ connection _____

person D gender _____ age _____ connection _____

Other, e.g. friends of the family

person A gender _____ age _____ connection _____

person B gender _____ age _____ connection _____

person C gender _____ age _____ connection _____

person D gender _____ age _____ connection _____

Public services

Police _____

Psychologist _____

Doctor _____

Others: _____

Information given in the conversation with the CPS:

	To a great extent	To some extent	No info
Background for the removal			
Consideration of the child's age/level/understanding			
Where the child is going			
Who the child shall live with			
Time perspective			
What happens with school/kindergarten			
What happens with activities			
Possibilities of contact with mother/father/siblings after removal			
Specific appointments about the first meeting			
Where mother will be			
Where father will be			
Where siblings (when removal of siblings) will be			
Additional information:			

During the conversation

The child: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

PHASE III - Packing/preparation

Who is present:

The child _____

Biological mother _____

Biological father _____

Siblings 1. gender _____ age _____

2. gender _____ age _____

3. gender _____ age _____

4. gender _____ age _____

5. gender _____ age _____

Caseworker(s) _____

Others: _____

Does the child bring anything besides clothes and toiletries

The child: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological mother: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological father: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

PHASE IV – Departure

In the situation

Who is present:

Biological mother _____

Biological father _____

Siblings 1. gender _____ age _____

2. gender _____ age _____

3. gender _____ age _____

4. gender _____ age _____

5. gender _____ age _____

Caseworker(s) _____

Others: _____

The child: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological mother: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological father: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Other physical reactions:

Holding : _____

Hugging: _____

Flight: _____

Aggression _____

PHASE V – The child drives with the CPS (and mother/father) to the standby home/foster home/institution

Who is present:

Biological mother _____

Biological father _____

Siblings	1.	gender _____	age _____
	2.	gender _____	age _____
	3.	gender _____	age _____
	4.	gender _____	age _____
	5.	gender _____	age _____

Caseworker(s) _____

Others: _____

Type of car and color of the car _____

In the car

The child: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological mother: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological father: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

PHASE VI – Arrival at the place where the child is going to stay

Who is present:

The child _____

Biological mother _____

Biological father _____

Siblings

1.	gender _____	age _____
2.	gender _____	age _____
3.	gender _____	age _____
4.	gender _____	age _____
5.	gender _____	age _____

Caseworker(s) _____

Others: _____

Foster parents person A _____ gender _____ age _____ name _____

person B _____ gender _____ age _____ name _____

Social worker at institution person A _____ gender _____ age _____ name _____

person B _____ gender _____ age _____ name _____

Other people present in foster home/institution

person A _____ gender _____ age _____

person B _____ gender _____ age _____

person C _____ gender _____ age _____

Caseworker(s) _____

Others: _____

At arrival

The child: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological mother: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological father: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

The CPS talks to the foster parents/social worker in the institution

Who is present:

The child _____

Biological mother _____

Biological father _____

Siblings

1.	gender _____	age _____
2.	gender _____	age _____
3.	gender _____	age _____
4.	gender _____	age _____
5.	gender _____	age _____

Caseworker(s) _____

Others: _____

Foster parents person A _____ gender _____ age _____ name _____

person B _____ gender _____ age _____ name _____

Social worker at institution person A ____ gender ____ age ____ name ____
 person B ____ gender ____ age ____ name ____

Other people present in the foster home/institution

person A _____ gender ____ age ____
 person B _____ gender ____ age ____
 person C _____ gender ____ age ____

Others: _____

Information given in the conversation with the CPS

	To a great extent	To some extent	No info
What the child is bringing			
The child’s habits (food/bed time/play)			
Contact with biological parents			
Contact with siblings			
Contact with CPS			
Concrete appointments being made			
Biological parents being present in the conversation			
Additional information:			

PHASE VII – CPS (and the biological mother/father) leaves

Parting

The child: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological mother: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Biological father: The same checklist for affective reactions, stress index, verbal measures and physical measures/coping strategies.

Child: Interview 1

Setting: During the interview only child and interviewer should be in the room where the interview takes place.

Child's Name: _____

Today's Date: _____

Child's ID Number: _____

Date of removal: _____

Child's Age: _____

Interviewer: _____

Child's Date of Birth: _____

Location of Interview: _____

Child's gender: Female Male

Time of interview session: Start: _____ End: _____ Total: _____ mins.

Part I: Introductory Questions

I am glad that we can talk for a little while. My name is _____ and today we are going to talk about how you think and feel about things. Some children think that adults do not always understand and I would like to learn more about how children think about their experiences. You _____ have experienced quite a lot during your life, and I would like to hear more about these experiences today. However, first I would like to know who lives in your family. What family members do you live with?

When we are talking I might say something that you don't understand or something that is wrong. So if I do that, let me know. If I ask the same question twice it is because I do not quite understand what you mean. Is that okay? And there is one more thing I want to tell you before we continue to talk. I will write down everything that you say to help me remember it afterwards. But mostly I'll try to listen carefully to what you are telling me

2. Who is _____ ? _____

3. Who is _____ ? _____

4. Who is _____ ? _____

5. Who is _____ ? _____

6.a) *If the child gives you the names of his/her foster family or of people at the institution, say: OK, you are real good at remembering all the names, but what about your real family?*

b). *If the child tells you about her/his biological family, say: OK, you are good at remembering all the names. Do you know the names of the ones who live in this house?*

Part II: Open-ended questions about the removal

7. I know that _____ and _____ from the Child Protective Services picked you up and you moved here. I wasn't there, so I would like you to tell me everything that YOU remember from the day that they came and you moved here.

8. Once the CPS people (names) came into your house/school/kindergarten, what was the first thing that happened? What happened right after that?

9. What else did happen that time?

10. Can you please tell me everything that you remember from that day, even if you think that it's not important?

After part II, continue with part III. If the child has not answered any questions in part II, move on carefully. Evaluate continuously how the conversation is going. If it is too difficult for the child, end the conversation with "here-and-now" things like looking at toys or the room and thank her/him for participating. Give the gift to the child, and thank her/him for having been so clever for telling you about such difficult issues. Tell the child that you will return in a little while.

*For the interviewer: Use more paper if necessary!
Take a break, eat fruit and have some water.*

Part III: Direct-questions about the removal, incl. false-memory questions

11. What time during the day did _____ and _____ come from the Child Protective Service (CPS)?

Was it in the morning? ___ in the afternoon ___ in the evening ___ during the night? ___

12. Where were you when the CPS came? Where you at home, at school, in the kindergarten or somewhere else when the CPS people came? If you were somewhere else, where were you?

13. Who was with you when _____ and _____ (CPS) came?

14. Was your mother there? _____

15. Was your father there? _____

16. Were any of your siblings there; sister/brother? _____

17. Was your preschool/teacher there? _____

18. When the CPS people (names) came into your house/class room/kindergarten and you first saw them, what were you doing?

19. What did your mother do when the CPS talked to her?

20. What did your mother say to the CPS?

21. What did your father do when the CPS talked to him?

22. What did your father say to the CPS?

23. Were there any other adults there when CPS came and you were removed from home, kindergarten, school?

What did the other adult(s) say to the CPS?

24. What kind of car did _____ and _____ (CPS) have? _____

25. What was the color of the car? _____

26. What were the colors of the clothes of _____ and _____ from the CPS?

27. What hair color did _____ and _____ from the CPS have?

28. Did the CPS workers have a dog with them when they picked you up?

29. Do you know how long you are going to stay here? At _____ and _____ place?

30. Are you going to continue at _____ kindergarten/school while you live here?

31. Have you had any visitors from the kindergarten/school while you have stayed here? _____

32. When are you going to meet your mother and father next time?

33. Now that you are living here, how often are you allowed to meet your mother and father?

34. It is often hard for both children and adults when children have to move. How did you feel when the CPS people came to pick you up?

- a) What did you do? _____
- b) What emotions did you express? _____
- c) What did you say? _____

35. Did anyone cry when the CPS came and picked you up and you moved here? _____ Who?

36. Did anyone from the CPS cry?

37. Who packed your things when you were leaving? Who helped you?

38. Did the researcher help you to pack? _____

39. Did anyone yell/cry when the CPS were at your place to help you move? _____.
Who?

40. Was anyone angry? _____ Who?

41. Was anyone happy when the CPS were at your mother's and father's place?
_____ Who?

42. Was anyone afraid? _____ Who?

43. Who was in the car with you when you drove here to _____ and _____
(foster home/institution)?

44. Did anyone else come? _____

- a) mother? _____
- b) father? _____
- c) CPS? _____
- d) Researcher? _____
- e) Preschool-teacher/teacher? _____
- f) Dog ? _____

45. Can you tell me what you brought when you came here?

46. Tell me what happened when you first arrived at the foster home?

What was the next thing that happened? What happened after that? Anything else?

47. Who was there waiting for you when you came to the foster home/institution?

Foster parents? _____ Child Protective Services? _____
Mother/father? _____ Others? _____
Teacher/pre-school teacher? _____

48. When the CPS people (and the researcher) were there at the foster home /institution with you, did _____ and _____ get to know anything about your likes and dislikes?

Did they get to know what you eat? _____

Did they get to know what you play with? _____

Did they get to know what you do before you go to bed? _____

49. Was your mother there when _____ and _____ got to know these things?

50. Was your father there when _____ and _____ got to know about these things?

51. Was anybody else there when _____ and _____ got to know these things?
For instance your teacher?

52. Was the CPS there when _____ and _____ got to know these things?

53. What happened after they got to know your likes/dislikes, what you eat, what you play and before you go to sleep? _____

54. What else?

55. What did you do when your mother and father _____ and _____ from the CPS were going to leave?

56. What did you say when your mother and/or father _____ and _____ from the CPS said goodbye to you at the foster home/institution?

57. How did your mother react when she said goodbye to you at the foster home/institution?

58. How did your father react when he said goodbye to you at the foster home/institution?

59. Now I've asked you about a lot of things. Is there anything else you would like to tell me about the day that you had to move to the foster home/institution?

Part IV: Questions about the time after the removal

60. How was it last time you met with your mother/father/ siblings? Please tell me what happened that time?

Anything else?

61. How do you feel now?

62. How have you been since you moved? Can you tell me more about that?

I would like you to tell me anything you are thinking about even if you don't feel it is important.

63. Do you know why you had to move? Why you can't live with your mother and father at the moment?

64. Had anyone told you about the possibility of you being taken away from your parents before it happened? If yes, when and who told you this?

65. How often did mom/dad talk to you about the removal?

Did they talk to you about it:

- a) not at all
- b) once
- c) two-three times
- d) daily

66. How well did you understand what was going to happen?

Do you think you knew:

- a) nothing at all
- b) something/a little bit
- c) well
- d) very well

67. Is there anything that might have been different on the day the CPS came and picked you up to move to _____ and _____?

68. If you could wish for one thing to be different now while you are in foster care/institution, what would that be?

69. What do you usually do here during the day?

70. Can you tell me where your mother is living now?

71. Can you tell me where your father is living now?

72. What about your sister/brother? Where does/do she/he/they live?

73. What do you usually do when you are with your biological family?

Closure/debriefing:

End the conversation with " here-and-now" things like looking at toys and the room or drawing. Give the child the gift, and thank her/him for having been so clever telling you about difficult issues. Tell the child that you will return in a while (follow-up after approximately 3 months).