Children and trauma

A broad perspective on exposure and recovery

Eva Alisic

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Kinderen en trauma

Een brede kijk op blootstelling en herstel

(met een samenvatting in het Nederlands)

Proefschrift

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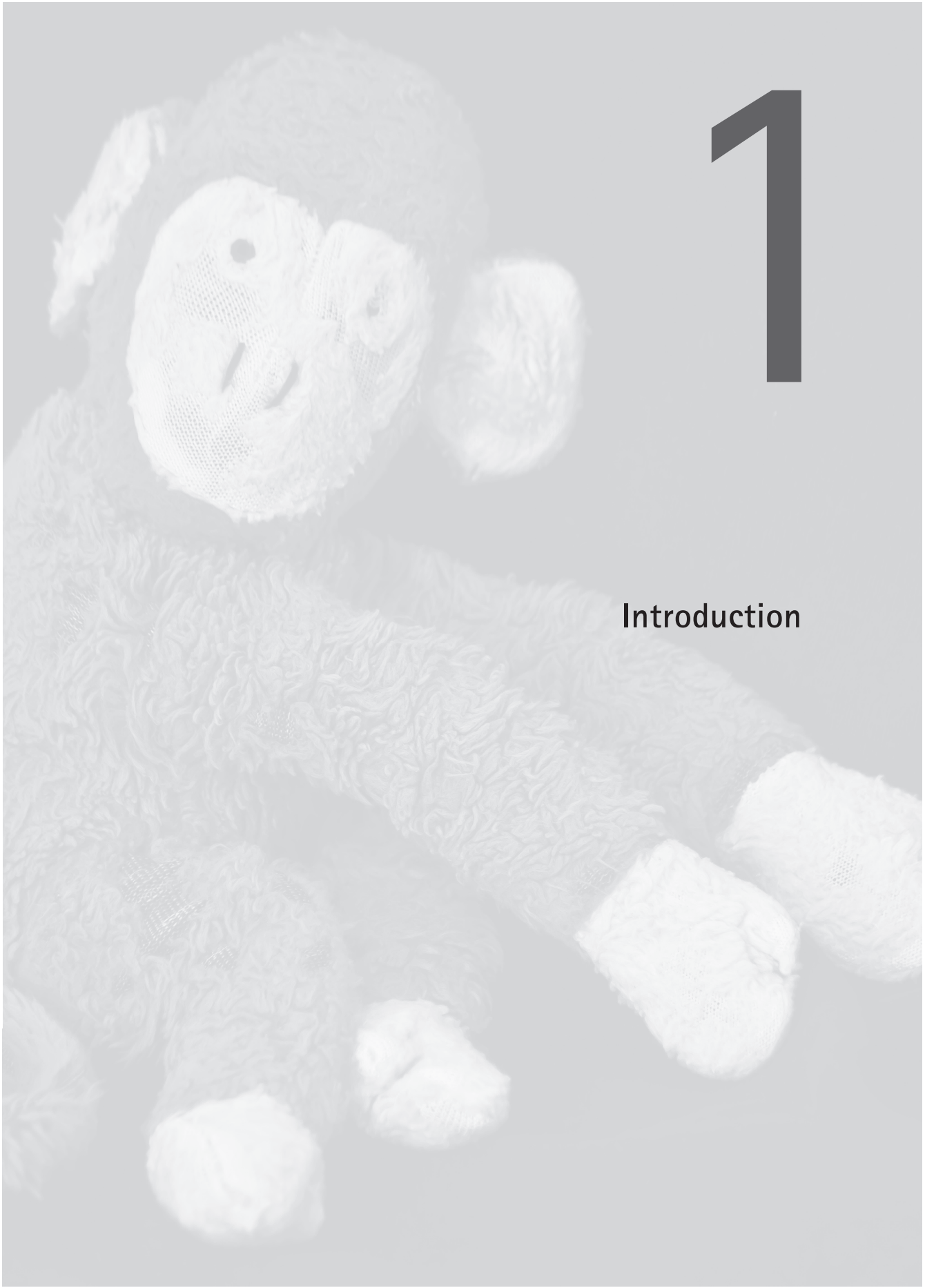
Contents



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Introduction

Joris (9 years old) was going to visit his grandfather together with his dad and little sister. They were cycling because his grandfather did not live far away. Because Joris was eager to see his granddad, he went ahead of the others. He crossed the road at a green traffic light and did not see the car that drove through the red light at high speed. He got hit and his leg was broken. At first he tried to stand up and walk away but, of course, he couldn't. Then he felt the pain and became frightened. His father tried to comfort him and his sister while they waited for the ambulance. After two months in hospital, he returned to school, but he did not want to cycle again for a long time.

Janne (11 years old) was chatting on the internet at home when all of a sudden the mother of a friend came by. She looked very anxious and said something was wrong with Janne's mother, that she was at the hospital. When they arrived at the hospital, a doctor informed them that Janne's mother had been attacked by a stranger with a knife. Janne's mother had to stay in hospital for a couple of days. Her mother looked terrible, and Janne thought she might die. Although she didn't die and came home in a couple of days, Janne was very scared of every man she saw, and had frightening dreams of bloody faces.

When children are confronted with severe stressors such as these, caregivers and professionals search for ways to prevent or reduce distress. Not infrequently, they feel helpless and uncomfortable in doing so. In the literature on psychological trauma, children and their caregivers occupy an unduly small place.[1] This dissertation focuses on children's exposure to and recovery from trauma, including the perspectives of children, parents, and teachers. The present chapter provides a description of the background of the dissertation and an outline of the studies that it contains.

Exposure to trauma in children

In the Diagnostic and Statistical Manual of Mental Disorders IV - Text Revision (DSM-IV-TR) a traumatic event is defined by two criteria. First, "the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others" (criterion A1, also called the 'objective' criterion). Second, "the person's response involved intense fear, helplessness, or horror", which may be expressed by disorganized or agitated behavior in children (criterion A2, also called the 'subjective' criterion) (American Psychiatric Association[2], p. 467). In this dissertation we refer to an event that fulfills the A1 criterion for PTSD when we speak of 'trauma', 'traumatic exposure', 'traumatic event', or 'severe stressor'. Because of the potential retrospective bias in recalling immediate reactions,[3] we do not require the fulfillment of the A2 criterion. Examples of traumatic events studied in

children are disaster,[e.g.,4,5] life-threatening accidents,[e.g.,6,7] serious medical conditions,[e.g.,8,9] maltreatment,[e.g.,10] war,[e.g.,11] and the sudden loss of a parent or sibling.[12]

Relative to studies of adults, epidemiological studies on rates of traumatic exposure in children are scarce. In addition, the rates that are found are highly variable. In a US study with adolescents in the southeast, 15% of them were found to report exposure.[13] One quarter of the youth in a longitudinal study in North Carolina had experienced at least one extreme stressor by age 16.[14] When the authors included more waves in the same study, 68% of the children reported at least one traumatic event.[15] Some authors[16] suggest that a cross-Atlantic difference in exposure exists, with high rates in the US and low rates in Europe. This appears to be confirmed by a study of German adolescents aged 14-24 years, where a relatively low exposure rate of 21% was found.[17] However, in a Danish sample of 13 to 15 year olds, 87% of the girls and 78% of the boys reported victimization.[18] Yet in the latter study, the definition of a stressor was broader and not restricted to the DSM criteria. For example, it also included parental divorce. The methodology and outcomes of these studies vary widely but they all show that traumatic exposure is rather prevalent in children. In addition, while these studies were conducted in Western countries in peacetime, in a number of countries large groups of children are subjected to war[19] or disaster.[4] Taken together, millions of children all over the world are exposed to severe stressors every year.[1]

Only a few studies have examined the factors that are related to exposure to trauma in children, with inconsistent outcomes. For example, with regard to gender, findings are highly contradictory. Giaconia et al.[20] found equal exposure rates in boys and girls, while Cuffe et al.[13] found girls to report more exposure than boys, and Vrana and Lauterbach[21] came to the opposite conclusion. With regard to ethnicity and region of residence there appears to be an association with exposure as well (suggesting that minorities and those living in urban areas are more at risk).[3,14,17,22-24] However, there are few studies of youngsters, and almost no studies of children younger than 12 years old that investigate these factors.

Earlier on it was thought that, even if children experienced trauma, it would cause only transient distress. To date, it is generally accepted that exposure can cause severe and long-term impairment.[25] Children may show mental as well as physical difficulties that have a negative impact on all domains of daily life.[26] The most extensively studied psychological consequences of exposure to severe stressors in children are posttraumatic stress and its pathological extremity, posttraumatic stress disorder (PTSD[2]).

Posttraumatic stress

Within the field of child trauma research, studies on the prevalence, co-morbidity, prevention, and treatment of PTSD are dominant. Estimates are that approximately one in three children exposed to trauma develops PTSD.[27] The disorder is characterized by overwhelming feelings of reexperiencing the event (e.g., nightmares and intrusive thoughts), by the avoidance of stimuli and emotional numbing (e.g., avoiding places related to the event and feeling detached from others), and by symptoms of hyperarousal (e.g., concentration difficulties and hypervigilance).[2] Children may suffer from PTSD for a long time.[28] It puts their well-being and development in emotional, social, academic, as well as physical domains at risk.[25,29-31]

A number of theories have been developed to account for the development of PTSD in adults (for an overview see Brewin & Holmes[32]). Although children are similar to adults in some ways, they are also different. The differences relate to the development of the body and brain, of cognitive processing, skill levels, and emotion regulation.[33-35] As an example, children have a more limited knowledge base than adults. This may result in a failure to appraise an experience accurately, potentially influencing the memory of the experience and a child's emotional response to it,[35] in a different way than it would influence adults. This precludes adult theory from being translated directly to children.

Although compared with adults little trauma theory has been formulated for children,[35] a number of frameworks have been developed. La Greca, Silverman, Vernberg, and Prinstein[36] modeled responses to natural disaster. They distinguished exposure characteristics (e.g., life threat during the event and loss or disruption following the event), pre-existing child characteristics (e.g., gender, ethnicity, age), the post-disaster recovery environment (e.g., major life events, social support) and the coping skills of the child as important factors influencing children's posttraumatic reactions. Pynoos, Steinberg, and Piacentini[37] developed a somewhat similar, but more complex, model. They set apart children's acute distress and longer-term adjustment after exposure. Short-term reactions are hypothesized to be associated with the experience of the trauma and influenced by a) proximal reminders (e.g., media coverage), b) proximal secondary stresses (e.g., loss of resources), c) the ecology of the child (e.g., parental psychopathology), and d) child intrinsic factors (e.g., temperament). Children's longer-term adjustment is further related to e) ongoing reminders, f) persistent secondary stressors, and g) related or sequential traumatization.

The models by La Greca et al. and Pynoos et al. provide an overview of factors influencing posttraumatic stress in children. In addition, several authors have homed in on specific mechanisms. For example, Ehlers and colleagues[38] concentrated on cognitive processes and hypothesized that the Ehlers and Clark model[39] would fit children. This model highlights the role of a) trauma memory deficits due to incomplete cognitive processing during the

event and cognitive avoidance after the event, b) excessively negative appraisals of the event leading to a sense of current threat, and c) dysfunctional behaviors and cognitive strategies (e.g., thought suppression) that are intended to control the perceived current threat but maintain posttraumatic stress reactions. Scheeringa and Zeanah[40] focused on the relationship between parents and children. In their model of Relational PTSD, they described three pathological parenting styles that lead to exacerbation of a child's symptoms. The first is the withdrawn (or unresponsive, unavailable) parent, who is emotionally and functionally unavailable because of his or her own traumatic stress symptoms. The overprotective (or constricting) parent hinders a child's recovery because he or she is preoccupied by fear that the child may be victimized again. The frightening (or reenacting, endangering) parent finally, is preoccupied by reminders of the trauma and continually confronts the child with these triggers or with dangerous situations. Although the model of Relational PTSD was intended for very young children, it may be helpful for understanding posttraumatic stress in elementary school children.

A need to look beyond PTSD in children

Although research on the development of PTSD is essential, it may run the risk of a narrow view of posttraumatic reactions, which makes it difficult to direct general prevention programs as well as specific treatment plans. In particular, the construct of PTSD has been criticized for not including several symptoms (such as regressive behavior, separation anxiety, and feelings of guilt) that children present with after trauma and for lacking a truly developmental approach.[23,41]

Additionally, in order to generate a complete view of posttrauma development of children, it is necessary to incorporate both negative and positive psychological sequelae in research. Studying positive consequences may be helpful in unraveling which strengths of children we can reinforce after exposure. The construct of posttraumatic growth may be valuable in this respect. It has been defined as the result of the struggle with highly challenging life crises, occurring in three domains: perception of self (e.g., considering oneself no longer a victim but a survivor), interpersonal relationships (e.g., becoming closer to relatives and friends), and philosophy of life (e.g., changing priorities).[42]

Finally, we need to focus on children's broader life circumstances, including their social and physical well-being. For example, it appears to be worthwhile to include concepts such as social support and quality of life[43] more often in child trauma research. Quality of life is a multidimensional construct originating from somatic medicine, which has begun to be explored in young populations with regard to mental health.[44]

In addition to these reasons to look beyond PTSD, two methodological reasons justify the broadening of child trauma research. PTSD is predominantly studied in a very structured

way, often in the form of questionnaires[e.g.,45,46] or structured interviews.[e.g.,47,48] While this is necessary to make research comparable, it should be accompanied by studies using qualitative methods in order to enable the discovery of new topics or processes that are relevant to children's recovery; currently this is rarely done. Second, when a severe stressor occurs, there are several 'actors' who are potentially important to investigate: the children themselves, their parents, and significant others. Children's symptoms are often measured by proxy or in a structured clinical assessment, but as yet their 'voices' have not been sufficiently heard.[49] The perspectives of teachers, who spend many hours per week with children, are also understudied. The same applies even to parents, whose views are rarely explored in depth.[1]

Purpose of this dissertation

To summarize the above, the rationale for this dissertation comes from a) indications that many children are confronted with traumatic events; b) reports that trauma can lead to serious and long-lasting consequences in children; c) the view that there is more to trauma than PTSD alone; and d) the identification of several gaps in knowledge that need to be filled in order to take better, more tailored care of children. The purpose of the dissertation is to generate a broad overview of children's exposure to and recovery from trauma in order to promote theory building and the design of prevention and intervention activities. It is conducted within and from the Psychotrauma Center for Children and Youth (University Medical Center Utrecht) in collaboration with Utrecht University (both in Utrecht, the Netherlands). Although we have included children of all ages in two chapters (4 and 5), most of the dissertation focuses on children in the last four years of elementary school (generally 8 to 12 years old) to ensure that participants were all in the same developmental phase and were able to verbalize emotions and thoughts.[35]

Outline

This dissertation employs a multi-method and multi-source approach[50] (see Table 1.1). As little is known about elementary school children's exposure to trauma, we start with an examination of prevalence rates in the general population in Chapter 2. In addition, we study the associations between demographic characteristics and trauma exposure, in order to formulate suggestions to direct prevention efforts more efficiently and effectively.

Because we proposed that one should look further than PTSD alone in children, we study the relationships between posttraumatic stress in a broad sense (including other child-specific reactions such as regressive behavior and separation anxiety), quality of

Table 1.1 Overview of methods and sources of the dissertation

Chapter	Method	Source
2	Quantitative: questionnaire study	1,770 children from the general population
3	Quantitative: questionnaire study	1,770 children from the general population (same sample as Chapter 2)
4	Mainly quantitative: secondary data-analysis, expert consultation, and questionnaire study	96 children in various samples, 7 experts, and 243 children from the general population study (same sample as Chapters 2 & 3)
5	Quantitative: meta-analysis	40 longitudinal studies
6	Qualitative: semi-structured interviews	25 children (former clients of the psychotrauma center)
7	Qualitative: semi-structured interviews	33 parents (of the children included in Chapter 6)
8	Mixed: semi-structured interviews followed by a questionnaire study	21 teachers for interviews and 765 teachers for questionnaires

life, and posttraumatic growth in Chapter 3 (based on the general population sample described in Chapter 2). We also examine the association between these constructs and exposure.

Chapter 4 is devoted to the evaluation of a measure of posttraumatic stress reactions in children. We describe the development of the Children's Responses to Trauma Inventory (CRTI). After giving an account of the validation of the original measure from 1996 in a variety of clinical and nonclinical samples, we examine the reliability and validity of a revised version in the general population sample that is described in Chapters 2 and 3.

In Chapter 5 we review longitudinal studies on posttraumatic stress in children. In particular, we look at evidence for risk and protective factors, and study the theoretical basis of studies that have been carried out up to the present. In order to draw conclusions about the factors that predict posttraumatic stress most strongly in children, we combine the effect sizes of the studies statistically.

Because it is important to combine large-scale quantitative information with in-depth qualitative knowledge to explore posttraumatic processes in children, we study children's views of their recovery process in Chapter 6. We use semi-structured interviews to gain a rich understanding of children's experiences.

While Chapter 6 focuses on the children themselves, in Chapter 7 we concentrate on parents' views of their children's recovery process. We interview the parents of the same sample about their role in their child's recovery.

Finally, in Chapter 8 we focus on a group of 'significant others' for children: teachers. In a mixed-methods study, we interview teachers to solicit their perspectives on assisting children after trauma, and subsequently test our findings with questionnaires in a population sample of elementary school teachers.

After these empirical chapters, we summarize and discuss our findings in Chapter 9, and provide a summary in Dutch in Chapter 10.

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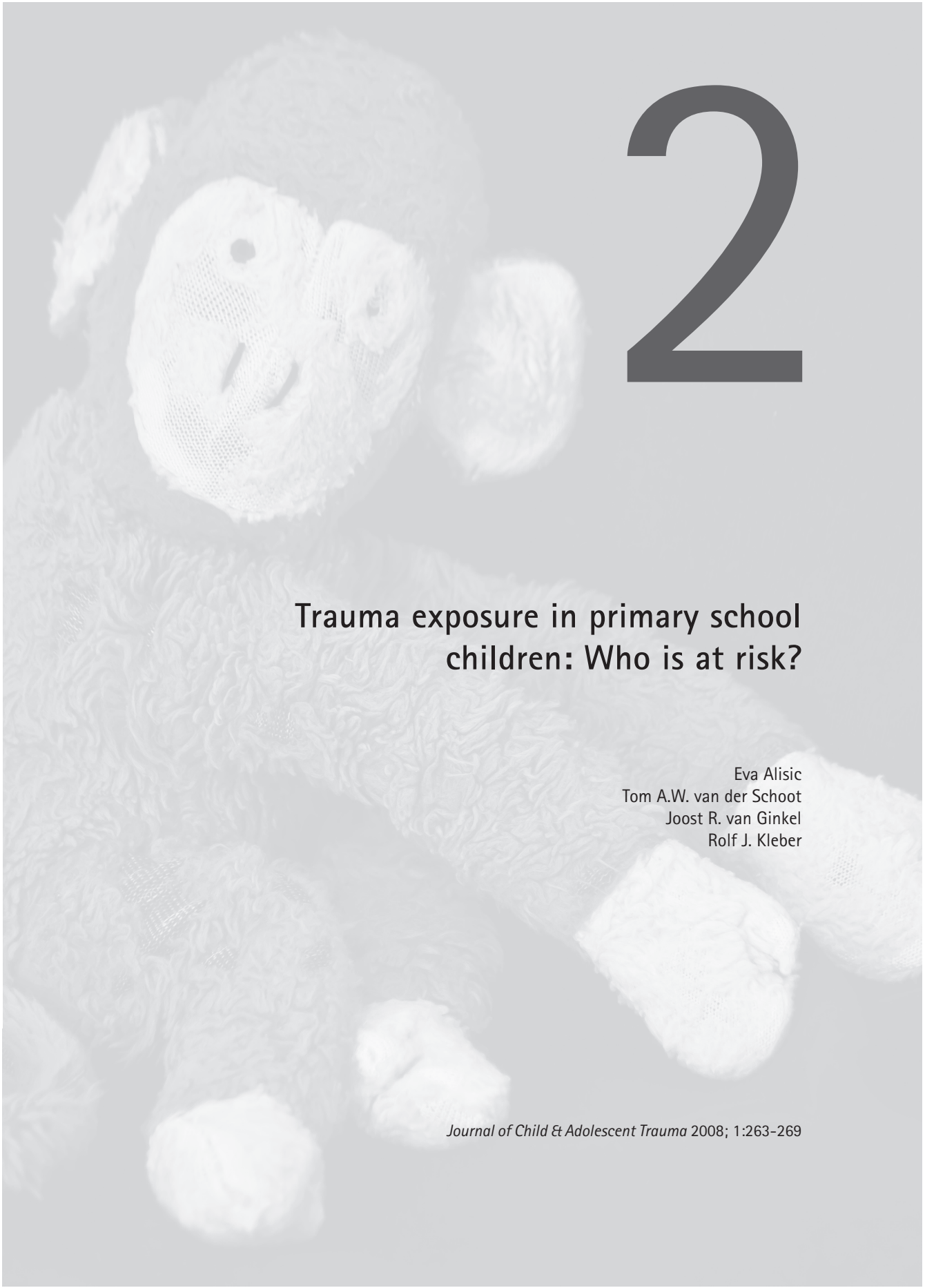

2

Trauma exposure in primary school children: Who is at risk?

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ABSTRACT

In order to direct efforts to prevent children from being exposed to trauma and its psychosocial consequences, more knowledge is needed about which children are at risk. Therefore, we examined demographic risk factors for trauma exposure in a sample of Dutch primary school children in the general population (*N* = 1,770, mean age 10.24 years). Fourteen percent of the children reported exposure. Age was positively associated with exposure while sex, ethnicity, and region of residence did not emerge as significant risk factors. These results imply that prevention measures should be provided not only to groups of children who are traditionally considered vulnerable but broadly.

INTRODUCTION

Exposure to traumatic events such as community violence, sexual abuse, serious accidents, and natural disasters can lead to anxiety and depressive symptomatology in children, including posttraumatic stress disorder (PTSD; see e.g., Bolton, O'Ryan, Udwin, Boyle, & Yule[1]). The most efficient way to prevent children from developing these symptoms and disturbances is to prevent them from being exposed. In order to direct prevention efforts efficiently and effectively, it is necessary to know which children are most at risk for exposure to trauma. Demographic risk factors, such as sex, age, ethnicity, and region of residence, would be cost-effective discriminating means with this regard if found to be of influence.

Only a few studies have been conducted in order to examine the relationship between demographic factors and exposure to trauma in children, with inconsistent results. With regard to sex, results were highly contradictory. Giaconia et al.[2] did not find a difference in general trauma exposure between adolescent boys and girls, while Cuffe et al.[3] found girls to report more exposure than boys, and Vrana and Lauterbach[4] concluded the opposite in their study of undergraduate students. Regarding specific types of events, there is more consistency. Most studies confirm that girls are more often exposed to sexual assault[e.g., 5-7] and boys more often to community violence.[5,8,9] Boys also appear to be exposed more often to accidents than girls,[5,7,8] but this could not be confirmed in all studies.[e.g., 2,6]

Concerning age, there appears to be a positive relationship with exposure to trauma,[e.g., 7,10] but these findings are not always consistent in violence studies.[9] Bernat et al.[5] described that trauma exposure in their sample usually began in adolescence, with a mean age of initial onset of 14 years. Most of the studies included adolescents and even young adults, but few studies involved younger children. Therefore, we have little information on age (and other) effects on trauma exposure in preadolescents.

Similar to age, ethnicity and region of residence appear to be associated with exposure to traumatic events. However, there are few studies in children with this respect. Concerning ethnicity, Breslau et al.[11] observed in their Detroit Area Survey that lifetime prevalence of assaultive violence was higher in non-White than in White adults. Frans, Rimmö, Åberg, and Fredrikson[12] reported increased prevalence of trauma exposure associated with being born abroad in Swedish adults. Cuffe et al.[3] and Finkelhor and Dziuba-Leatherman[13] found similar results in children, with children in minority groups being exposed to violence more often than children in majority groups. However, Costello et al.[6] did not find a significant difference in risk of experiencing a traumatic event due to ethnicity. With regard to region of residence, almost no studies in children included both urban and rural areas. When included, higher rates of exposure were associated with living in urban areas compared to rural areas.[7,9,13] However, these studies mainly concerned exposure to violence. The differences between urban and rural areas in risk for exposure to other types of traumatic events have not yet been examined in children.

To shed more light on the relationship between demographic characteristics and trauma exposure in children, we studied the associations between sex, age, ethnicity, and region of residence on the one hand, and trauma exposure on the other hand in a large sample of primary school children in the general population.

METHODS

The data were collected in the context of an epidemiological study on trauma and its psychosocial consequences in children in Utrecht, a province in the middle of the Netherlands with urban as well as rural regions. The study protocol was approved by the Medical Ethics Committee of the University Medical Center Utrecht.

Thirty-six randomly selected schools participated in the study, with 1,770 children completing a questionnaire (age range 7 to 13 years, mean age 10.24 years, SD = 1.21, further coded as younger than 10 years old versus 10 years or older). Ethnicity and region of residence were defined as having autochthonous parents versus having one or both parents born abroad, and living in a rural versus an urban area, respectively (in line with Statistics Netherlands[14]). Compared to national data (Statistics Netherlands), the amount of boys was representative (50% compared to 51%; $\chi^2[1, N = 1{,}770] = .97$; $p = .33$), but children with parents born in a foreign country were somewhat underrepresented (13% compared to 23%; $\chi^2[1, N = 1{,}727] = 95.84$, $p < .01$) as were children in urban areas (23% compared to 42%; $\chi^2[1, N = 1{,}770] = 276.70$, $p < .01$).

The children were asked to indicate whether they had or had not experienced the events listed in the exposure section of the UCLA PTSD Reaction Index for DSM-IV (UCLA PTSD RI[15]) and to describe their worst experience ever. Trauma exposure was considered present when the described event fulfilled the A1 criterion for PTSD of the DSM-IV.[16] Two trained graduate students in clinical psychology independently decided whether or not the event fulfilled the criterion and what type of event it concerned, according to the categorization of the UCLA PTSD RI. In case of disagreement (Cohen's kappa was .58 for the traumatizing character and .86 for the type of the event), a third rater (EA)'s judgment was employed to decide by majority.

Missing data were rare (2%) and were multiply imputed (m = 5) using latent class modeling (Van Ginkel[17]; BIC [Bayesian Information Criterion] = 95111.93). Odds ratios for each variable were computed for exposure regardless of type of event and for exposure to specific types of events, and were combined according to Rubin's rules for multiple imputation.[18]

RESULTS

Fourteen percent of the children described a traumatic event as defined by the A1 criterion for PTSD (see Table 2.1). The sudden death or serious injury of a loved one, such as a best friend who died suddenly or a sibling who had committed suicide, was reported most frequently (by 5% of the children). The next most frequent were disaster experiences (in 2% of the children), such as a flood disaster due to the collapse of a dike. Several forms of violence accounted for 4% of the described events. For example, one child saw a boy being beaten badly by police when he was on holiday. In general (regardless of the type of event), younger children were less likely to be exposed to trauma than older children (OR = 0.7, p = .01, 95% CI = 0.5–0.9). With regard to the specific types of events, younger children were less likely to report the sudden death or serious injury of a loved one than older children (OR = 0.6, p = .02, 95% CI = 0.4–0.9), but no age differences were found for the other types of events. No significant sex, ethnicity, or region of residence differences were found. Because of their small frequencies, no analyses were carried out on war experiences and sexual assault.

DISCUSSION

This study explored demographic risk factors for trauma exposure in a large sample of primary school children in the normal population. Fourteen percent of the children reported exposure to a traumatic event. Age appeared to be positively associated with trauma exposure in general and with the experience of the sudden death or serious injury of a loved one specifically. Sex, ethnicity, and region of residence did not emerge as significant risk factors.

When considering these results, the limitations of the study should be kept in mind. First, its cross-sectional design does not allow for causal inferences. Although one could argue that sex and age are naturally prior to exposure, this cannot be said of being autochthonous or of residence area. Second, although the children were primed with yes or no questions about exposure to different types of events, exposure to trauma was finally estimated from the described worst experiences only. A third limitation concerns indications of smaller participation rates in relatively poor neighborhoods. We noticed that parents in these areas were somewhat more reluctant to 'opt in' for the study than parents in other neighborhoods. We still had a large and varied sample, but generalizations should be made with care (a limitation that also applies to other trauma studies where active parent approval is required). Finally, while this study has focused on easy-to-determine risk factors because of their cost-effectiveness in prevention efforts, it is possible that less accessible characteristics have more predictive power. For example, prior victimization appears to be a risk factor for future violence exposure.[e.g., 13] Despite these limitations, in our view the

Table 2.1 Relationship between demographic variables and exposure to traumatic events in primary school children

		All	Boys	Girls			< 10 years	≥ 10 years			Dutch	Foreign			Rural	Urban		
		%	%	%	*OR*	*p*	%	%	*OR*	*p*	%	%	*OR*	*p*	%	%	*OR*	*p*
1.	Disaster	2.2	2.7	1.7	1.6	.17	2.1	2.2	0.9	.85	2.1	2.6	0.7	.49	2.6	0.9	3.1	.06
2.	Accident	1.9	1.9	1.9	1.0	.99	1.2	2.3	0.5	.10	1.8	2.2	0.8	.69	1.8	2.1	0.9	.81
3.	War	0.0	0.0	0.0	–	–	0.0	0.0	–	–	0.0	0.0	–	–	0.0	0.0	–	–
4.	Victim of domestic violence	0.8	1.1	0.5	2.5	.30	0.8	0.8	1.0	.99	0.8	0.9	0.9	.84	0.8	0.8	1.1	.92
5.	Witness of domestic violence	0.5	0.6	0.5	1.3	.72	0.5	0.5	1.0	.95	0.5	0.9	0.5	.40	0.5	0.5	1.1	.95
6.	Victim of community violence	1.8	2.4	1.1	2.1	.11	1.4	2.0	0.7	.41	1.9	0.9	2.2	.28	1.5	2.8	0.5	.14
7.	Witness of community violence	0.8	0.9	0.8	1.2	.77	0.9	0.8	1.2	.78	0.6	2.2	0.3	.08	0.7	1.3	0.6	.39
8.	Sexual assault	0.3	0.1	0.6	–	–	0.1	0.5	–	–	0.4	0.0	–	–	0.3	0.5	–	–
9.	Death or injury of loved one	4.9	4.2	5.5	0.8	.24	3.5	5.9	0.6	.02*	4.8	5.4	0.9	.72	4.9	4.8	1.0	.89
10.	Serious medical condition	0.5	0.7	0.2	3.0	.79	0.4	0.5	0.8	.99	0.5	0.4	1.0	.99	0.4	0.5	0.9	.86
11.	Other stressful event	0.6	0.4	0.7	0.5	.35	0.5	0.6	0.9	.88	0.6	0.5	1.1	.91	0.5	0.7	0.7	.70
	Any traumatic event	14.1	14.9	13.4	1.1	.35	11.5	16.1	0.7	.007**	13.9	16.1	0.8	.38	14.0	14.7	1.0	.80

Note: $N = 1,770$. *$p < .05$. **$p < .01$.

strengths of this study lie in including a sample of young children in the normal population and in measuring the complete range of types of traumatic events.

Surprisingly, the prevalence of trauma exposure of 14% was considerably lower than prevalence rates found in other studies where percentages well above 40% were common (see e.g., Copeland et al.[10]; Giaconia et al.[2]; Vrana & Lauterbach[4]). While methodological differences are probably of influence, it is unlikely that they provide a full explanation. In general, the studies finding high exposure rates included adolescents or even young adults. It would be natural for a study in younger children to arrive at lower estimates, especially when taking into account the observation of Bernat et al.[5] that most exposure to traumatic events occurs in adolescence. Our relatively low prevalence rate could also be seen as a confirmation of the existence of a cross-Atlantic difference,[12] with American youth victimized more often than European youth. For example, witnessing physical community violence is reported commonly in American children, with rates ranging approximately from 40% to 80% in several studies,[9] as opposed to the low rates in our sample.

With regard to risk factors for exposure, the positive relationship between age and exposure has already been confirmed in samples with a larger age range,[10] but apparently, even within a sample of young children, age plays a role. On the one hand, older children simply have had more time to be exposed than younger children. On the other hand, developmental changes toward a greater autonomy in traveling and social interactions may put children more at risk. For example, the transition from being brought to school to traveling autonomously is generally made during the first years of primary school.

In contrast to age, we did not find significant variation in traumatic exposure due to sex, ethnicity, or region of residence. As mentioned in the introduction, earlier studies reported contradictory results, varying from zero to negative as well as positive effects. Our study confirms the zero effect indications[e.g., 2,6] in children. The dissimilarity in findings might be explained by methodological issues. For example, several studies were based on convenience samples, such as undergraduate psychology students,[e.g., 4] which might be biased (see e.g., sex differences in trauma exposure in Tolin & Foa[19]). In addition, the instruments used to measure trauma exposure included self-report questionnaires,[e.g., 5; the present study] telephone interviews[e.g., 13] and structured face-to-face interviews,[e.g., 10] differently affecting respondents' feelings of confidentiality and subsequent answering behavior. In order to reach robust conclusions, especially with regard to children, replication in large epidemiological samples will be needed.

Until we have acquired a broader base of evidence, our conclusion is that we should adopt a broad-spectrum approach with regard to prevention efforts, with some extra attention for older children. It appears important not to stick to prevention programs only for groups of children who are traditionally viewed as vulnerable (e.g., inner-city children). In order to reach large groups of children, teachers at primary schools would

be appropriate providers of information on safety in, for example, traveling from home to school and interacting with others. Although we can attempt to make children aware of some safety risks, we cannot protect them from all types of exposure. Therefore, secondary prevention (i.e., prevention of the development of psychopathology) is of high importance. While the sudden loss or injury of a loved one was reported frequently in our sample, health care providers play an important role. For example, while most of the time their attention goes out to severely ill or dying patients, hospital staff need to be aware of possible psychological effects in the children who are attached to these persons, and to refer them to mental health professionals when necessary.

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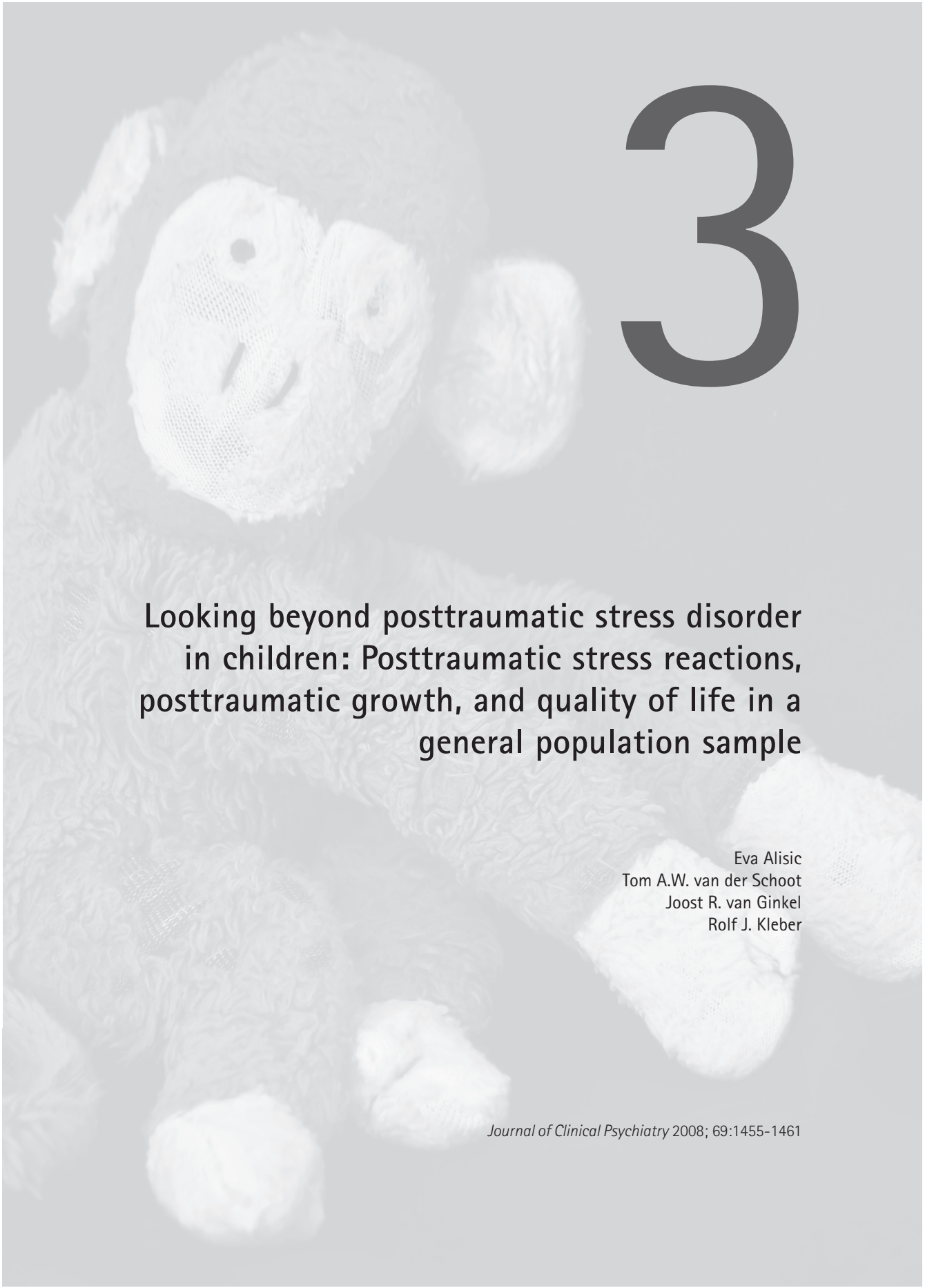

3

Looking beyond posttraumatic stress disorder in children: Posttraumatic stress reactions, posttraumatic growth, and quality of life in a general population sample

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ABSTRACT

Objective: In order to broaden the view beyond posttraumatic stress disorder (PTSD) in children, we examined to what extent posttraumatic stress reactions, posttraumatic growth, and quality of life were related to each other and to traumatic exposure in the general population.

Method: 1,770 children of 36 randomly selected primary schools (mean age = 10.24 years, 50% boys) reported in October/November 2006 on their worst experience (traumatic exposure was considered present when the described event fulfilled the A1 criterion for PTSD of the DSM-IV TR) and filled out the Children's Responses to Trauma Inventory, the Posttraumatic Growth Inventory for Children, and the KIDSCREEN-27. Correlational and hierarchical linear regression analyses were carried out in a multiple imputation format.

Results: Posttraumatic stress reactions were strongly related to posttraumatic growth ($r = .41$, $p < .01$) and quality of life ($r = -.47$, $p < .01$). The latter two variables were weakly related; positively when controlling for posttraumatic stress reactions ($r = .09$, $p < .01$), negatively when not ($r = -.12$, $p < .01$). Children who were exposed to trauma reported more posttraumatic stress reactions ($\beta = .12$, $p < .01$), more posttraumatic growth ($\beta = .09$, $p < .01$), and less quality of life ($\beta = -.08$, $p < .01$) than non-exposed children (effect sizes were small).

Conclusions: Negative and positive psychological sequelae of trauma can co-exist in children, and extend to broader areas of life than specific symptoms only. Clinicians should look further than PTSD alone and pay attention to the broad range of posttraumatic stress reactions that children show, their experience of posttraumatic growth, and their quality of life.

INTRODUCTION

Many children are exposed to traumatic events such as community violence, sexual abuse, serious accidents, and natural disasters.[1] Although reported prevalence rates of exposure vary considerably between studies, ranging from 15%[2] to 84%,[3] even the lowest rates indicate that exposure to trauma is a rather common experience in childhood. Research on the psychological consequences of traumatic experiences for children is expanding. Until now, studies have mainly focused on posttraumatic stress disorder (PTSD) which has been found to be the most prevalent disorder after traumatic exposure.[4]

However, several problems arise in using the construct of PTSD with regard to children. First, it was designed to describe adult symptoms. Several studies have indicated that children's reactions to trauma differ from adult reactions.[5,6] Although some developmental modifications have been made in the DSM-IV,[7] they do not appear to be fully adequate in describing children's symptoms.[8,9] Second, the existence of the construct of PTSD even in adults is subject to debate. Criticisms concern, for example, the disregard of studies reporting resiliency in survivors, the nonspecificity of PTSD symptoms to traumatic experiences, and the influence of political opinions on the formulation of the disorder.[10] Finally and most notably, studying only a pathologic reaction to trauma in children may lead to a narrow view from which it is difficult to direct general prevention programs or specific treatment plans. A broader view is necessary, taking into account not only PTSD, but also the wide range of posttraumatic stress reactions, both negative and positive psychological sequelae, and specific reactions as well as general well-being. Studying constructs that cover these areas, such as posttraumatic stress reactions, posttraumatic growth, and quality of life, will enable a better understanding of threats and opportunities in prevention and treatment, and will further the theoretical understanding of psychological processes in children after trauma.

The construct of posttraumatic stress reactions in children has been proposed in order to encompass the broad range of psychosocial symptoms that children may experience after traumatic exposure.[11] It includes not only the PTSD symptoms of reexperiencing the trauma, avoidance and numbing, and increased arousal,[7] but also other reactions having empirical value, such as feelings of guilt,[12] psychosomatic complaints,[13] regressive behavior,[14] and separation anxiety.[15] Although the construct was proposed years ago and has been mentioned in theoretical articles,[5,11] few empirical studies include all of these reactions.

The construct of posttraumatic growth was initially described in adults and concerns positive sequelae of trauma. As a result of the struggle with highly challenging life crises, the experience of positive change may occur. This change may take place in three domains: perception of self (e.g., considering oneself no longer a victim but a survivor), interpersonal relationships (e.g., becoming closer to relatives and friends), and philosophy

of life (e.g., changing priorities).[16] Because children's appraisal of events and capacity to verbalize emotional states are not yet fully developed, questions have been raised about the applicability of the construct of posttraumatic growth to children. However, recent findings with children who had experienced a road traffic accident[17] and child survivors of a hurricane[18] suggest that children are able to experience significant growth.

The construct of quality of life originates from somatic medicine, emphasizing clients' subjective view of their life circumstances.[19] Quality of life is conceptualized in many ways but regularly as a multidimensional construct covering physical, emotional, behavioral, social, and mental components of well-being.[20] Recently, the construct has begun to be explored in young populations with regard to mental health. Sawyer and colleagues[21] reported, for example, that children with a mental disorder had a worse quality of life than children with a physical disorder in many areas, such as in the social and school domains.

The purpose of our study was to explore the role of posttraumatic stress reactions, posttraumatic growth, and quality of life in relation to each other and in relation to traumatic exposure. Our knowledge to date is mainly based on studies in convenience samples of exposed children only, which provides incomplete information on how children typically respond to trauma.[1] Therefore, we studied a large sample of children in the general population. We expected to find significant positive relationships between posttraumatic stress reactions and posttraumatic growth[17] and between posttraumatic growth and quality of life, and a significant negative association between posttraumatic stress reactions and quality of life. With regard to traumatic exposure, we anticipated significantly more posttraumatic stress reactions, more posttraumatic growth and a lower quality of life in exposed children than in non-exposed children.

METHODS

Participants

The data were collected in October and November of 2006 in Utrecht, a province in the middle of the Netherlands with urban as well as rural regions. Thirty-six randomly selected schools participated in the study, with 3,787 potential respondents in the last four grades of primary school (in these grades children are aged 8-12 years). A total of 1,770 children, whose parents signed informed consent (according to an opting-in procedure) and who were present on the day of data collection, filled out the questionnaire. The mean age of the children was 10.24 years (*SD* = 1.21 years). The sample comprised 882 boys and 888 girls (both 50%), which was in accordance with the national population (51% of primary school children are boys,[22] $\chi^2 = .97$; $p = .33$).

Measures

Demographic characteristics. The children reported their age, gender, and grade level.

Exposure. The children were asked to describe their worst experience ever and to indicate how long ago it took place. Traumatic exposure was considered present when the described event fulfilled the A1 criterion for PTSD of the DSM-IV-TR.[23] Two raters independently decided whether the event fulfilled the criterion or not. In case of disagreement (Cohen κ was 0.58), a third rater made the final decision. Criterion A2 for PTSD was not examined.

Posttraumatic stress reactions. The Children's Responses to Trauma Inventory (CRTI, revised version,[24] psychometrics described by EA and RJK, Chapter 4) consists of 34 items. Children answer, on a five-point Likert scale, to what extent a reaction to a traumatic event was present during the past seven days (scores range 1 to 5). The measure contains four subscales: intrusion (7 items), avoidance (11 items), arousal (6 items) and other child-specific responses (i.e., relevant reactions not mentioned in the DSM-IV; 10 items). Other child-specific responses include feelings of guilt, regressive behavior, reckless behavior, fear of the dark, fear of going to the toilet at night, separation anxiety, sadness, crying, feeling tired, and psychosomatic complaints. Cronbach's α was .92 for the total scale and .81, .80, .72, and .78 for the respective subscales.

Posttraumatic growth. The Posttraumatic Growth Inventory for Children (PTGI-C,[25] psychometrics of an earlier version described by Cryder et al.[18]) is an adaptation of the Posttraumatic Growth Inventory, which is frequently used with adults.[26] The 10 items have a four-point Likert scale and a 'don't know' option. There are no subscales. For the Dutch version, a back translation procedure has been carried out. Cronbach's α in the current study was .85.

Quality of life. The KIDSCREEN-27[27] (psychometrics described by Ravens-Sieberer et al.[28]) is a 27-item instrument that covers five dimensions of quality of life: physical well-being (5 items), psychological well-being (7 items), autonomy and relationship with parents (7 items), peers and social support (4 items), and school environment (4 items). The questions concern the last seven days and answers are given on a five-point Likert scale. Cronbach's α was .72, .77, .75, .75 and .69 for the respective subscales and .89 for the total scale.

Procedures

The study protocol was approved by the Medical Ethics Committee of the University Medical Center Utrecht. The construction of the questionnaire placed the measure on quality of life ahead of the measures for exposure, posttraumatic stress reactions, and

posttraumatic growth in order to prevent biased answers, although the topic of the research was openly announced in the introduction. Children filled out the questionnaire in a quiet classroom setting but could ask for explanations of difficult words when necessary, and were free to participate or not (there was 100% participation). Schools, parents, and children were informed about possibilities of receiving psychosocial support.

Data preparation and analysis

The percentage of missing data was small (2.71%), but could add up to a higher percentage for analyses on sum variables. In order to arrive at unbiased estimates, we applied latent class modeling and two-way imputation for separate scales in a multiple imputation format (number of imputed datasets = 5). Categorical data (including the PTGI-C, which had a 'don't know' option) were imputed using latent class analysis[29] with a 4-class model (Bayesian information criterion = 95111.93), which was computed with Latent GOLD 4.0 software.[30] Scale data from the KIDSCREEN-27 and CRTI were imputed by means of two-way imputation for separate scales[31] using SPSS 12.0.2 software.[32] Respondents with more than 60% missing data on the three measures were excluded, leading to imputed data of 1,686 children.

Full and partial Pearson correlations were computed for the relationships between posttraumatic stress reactions, posttraumatic growth, and quality of life. Hierarchical linear regression analyses with two steps were carried out to estimate the contribution of traumatic exposure to the three variables, controlling for the time elapsed since the event (zero to six months ago vs. more than six months ago), gender, and age. All analyses were carried out on the five estimated datasets with SPSS 12.0.2 software and were combined according to Rubin's rules for multiple imputation.[33]

RESULTS

Relationships among variables

Posttraumatic stress reactions were strongly related to posttraumatic growth; the more children experienced posttraumatic stress reactions, the more they experienced posttraumatic growth (r = .41, p < .01). The relationship between posttraumatic stress reactions and quality of life was also strong, but negative; children experiencing more posttraumatic symptoms reported a lower quality of life (r = -.47, p < .01). The relationship between posttraumatic growth and quality of life was significant but small; children reporting more posttraumatic growth reported a somewhat lower quality of life (r = -.12, p < .01). Partial correlations yielded grossly the same picture for the first two correlations (r = .41 and r = -.46 respectively) but not for the third; when controlling for posttraumatic

Table 3.1 Means and standard deviations for quality of life, posttraumatic stress reactions, and posttraumatic growth

	All children (*N* = 1,686), Mean (*SD*)	Exposed children (*N* = 246), Mean (*SD*)	Non-exposed children (*N* = 1,440), Mean (*SD*)
Quality of life (KIDSCREEN-27), total score	114.4 (11.7)	112.3 (12.3)	114.8 (11.6)
Physical well-being score[a]	21.0 (3.0)	20.6 (3.5)	21.1 (2.9)
Psychological well-being score[a]	29.4 (3.8)	28.5 (4.3)	29.6 (3.7)
Autonomy and relation with parents score[a]	29.7 (4.0)	29.5 (3.9)	29.7 (4.1)
Peers and social support score[a]	17.4 (2.4)	17.2 (2.5)	17.4 (2.4)
School environment score[a]	16.9 (2.4)	16.4 (2.4)	17.0 (2.4)
Posttraumatic stress reactions (CRTI), total score	65.7 (21.7)	70.9 (22.0)	64.8 (21.5)
Intrusion score	12.8 (5.5)	14.3 (5.6)	12.5 (5.4)
Avoidance score	22.8 (8.2)	24.6 (8.0)	22.5 (8.2)
Arousal score	11.6 (4.7)	12.9 (4.9)	11.3 (4.6)
Other child-specific responses score	18.6 (6.9)	19.2 (7.1)	18.5 (6.9)
Posttraumatic growth (PTI-C), total score	11.7 (7.7)	13.0 (7.6)	11.5 (7.6)

[a] All mean scores for the KIDSCREEN-27 subscales corresponded to t-scores ranging from 45.2 to 54.3, within the normal range.[25] CRTI = Children's Responses to Trauma Inventory, PTGI-C = Posttraumatic Growth Inventory for Children.

stress reactions, the relationship between posttraumatic growth and quality of life turned out to be positive instead of negative (r = .09; for all correlations p < .01). Means and standard deviations of the variables are shown in Table 3.1.

Relationship with exposure

About 1 in 7 children (14%) described a traumatic event as defined by the A1 criterion of the DSM-IV-TR. The sudden death or serious injury of a loved one (parent, sibling, or best friend) was the most frequently described traumatic event, followed by disaster experiences, and accidents (Table 3.2). Examples of experiences that were judged nontraumatic were the divorce of parents, the death of a grandparent, and minor accidents.

The hierarchical linear regression analyses are shown in Table 3.3. (Only the analyses of the total scales are depicted; the tables of the analyses of subscales are available from the corresponding author upon request.) From the regression analyses for posttraumatic stress reactions, a consistent picture arose: the children who reported a worst experience that was categorized as traumatic had significantly more posttraumatic reactions in all domains (intrusion, avoidance, arousal, other child-specific responses, and total of symptoms) than children whose worst experience was non-traumatic (p < .01). Based

Table 3.2 Types of traumatic events described by school children exposed to trauma in a general population sample (*N* = 246)

Event	*N*	%	Example
Disaster	37	15	Flood due to dike collapse
Accident	32	13	Car accident on the highway
War	0	0	–
Domestic violence	23	9	Witnessing violence between parents
Community violence	46	19	Witnessing physical assault of a boy on the street
Sexual Assault	5	2	Rape
Injury/death of loved one	86	35	Sudden death of brother
Serious medical condition	8	3	Nearly fatal meningitis
Other stressful event	9	4	Witnessing a suicide attempt
Total	246	100	

on normative criteria, 15% of the exposed children showed probable PTSD or probable acute stress disorder. Exposure to trauma also contributed significantly to the experience of posttraumatic growth: exposed children reported more posttraumatic growth than nonexposed children ($p < .01$). Finally, exposure made a significant contribution to overall quality of life: children who described a traumatic event reported lower total quality of life than children whose worst experience was not traumatic ($p < .01$). Physical, psychological, and school well-being were also significantly negatively related to exposure ($p < .05$). The domain of autonomy and relationship with parents and the domain of peers and social support were not significantly related to exposure to trauma.

DISCUSSION

In this study we examined to what extent posttraumatic stress reactions, posttraumatic growth, and quality of life were related to each other and to traumatic exposure in a large sample of primary school children in the general population. Our hypotheses were in large part confirmed. The first main finding consisted of significant associations between the constructs. Posttraumatic stress reactions and posttraumatic growth were strongly and positively related to each other. It suggests that negative and positive psychological sequelae of trauma can coexist in children. Similar observations were made by Salter and Stallard[17]: 37% of young road traffic accident victims who experienced posttraumatic growth also presented with PTSD. In a slightly older sample of adolescent survivors of cancer, posttraumatic growth and posttraumatic

Table 3.3 Hierarchical linear regression analyses

			B	*SE*	*p*-value	β	*F*-value	*p*-value	R^2	ΔR^2
Posttraumatic stress reactions										
	Step 1	Constant	100.42	4.52	<.01		34.81	<.01	.06	
		Time lag	-4.69	1.18	<.01	-.09				
		Gender	5.30	1.03	<.01	.12				
		Age	-3.31	.43	<.01	-.18				
	Step 2	Constant	101.11	4.49	<.01		33.04	<.01	.07	.01
		Time lag	-4.90	1.17	<.01	-.10				
		Gender	5.42	1.02	<.01	.12				
		Age	-3.47	.43	<.01	-.19				
		Trauma	7.42	1.45	<.01	.12				
Posttraumatic growth										
	Step 1	Constant	22.72	1.62	<.01		18.74	.01	.03	
		Time lag	.59	.42	.16	.03				
		Gender	.07	.37	.85	.00				
		Age	-1.12	.15	<.01	-.18				
	Step 2	Constant	22.90	1.61	<.01		17.23	<.01	.04	.01
		Time lag	.54	.42	.20	.03				
		Gender	.10	.37	.79	.01				
		Age	-1.17	.15	<.01	-.19				
		Trauma	1.87	.53	<.01	.09				
Quality of life										
	Step 1	Constant	108.30	2.51	<.01		3.20	.07	.01	
		Time lag	1.37	.65	.04	.05				
		Gender	-.33	.57	.56	-.01				
		Age	.51	.24	.03	.05				
	Step 2	Constant	108.05	2.50	<.01		5.27	<.01	.01	.01
		Time lag	1.46	.65	.03	.05				
		Gender	-.38	.57	.50	-.02				
		Age	.57	.24	.02	.06				
		Trauma	-2.74	.82	<.01	-.08				

symptoms were positively associated as well.[34] The results imply that posttraumatic stress reactions and posttraumatic growth should not be seen as psychological sequelae on a continuum with a positive pole on one side and negative pole on the other, but rather as coexistent constructs.

Posttraumatic stress reactions and quality of life were also strongly related to each other in our study, but negatively. Likewise, young adult survivors of childhood cancer showed more impairment on quality of life when they had PTSD than when they were not diagnosed with the disorder.[35] In adult samples (e.g., of patients admitted to intensive care units[36] and patients with depressive and anxiety disorders[37]) similar associations were found. Our results suggest that in children, too, consequences of traumatic exposure extend beyond specific symptoms to broader areas of life.

Finally, at first glance, the relationship between quality of life and posttraumatic growth appeared significant and negative (but weaker than the other two associations), contrary to our expectations. However, after controlling for the influence of posttraumatic stress reactions, the real association turned out to be positive (and significant but small). We could not locate any studies on the relation between quality of life and posttraumatic growth in children, and only one study in adults. The study on adult survivors of bone marrow transplantation found no significant association between quality of life and positive psychological sequelae such as a new philosophy of life or improved family relationships. The authors questioned the assessment of quality of life, however, suggesting that with a different measurement approach a relationship between the constructs have been found.[38] Our findings confirm the existence of an association between these two constructs in children but suggest that the presence of posttraumatic stress reactions overrules its direction.

The second main finding of our study held that posttraumatic stress reactions, post-traumatic growth, and quality of life were significantly related to traumatic exposure. Children who described a traumatic experience reported more posttraumatic stress reactions (on all domains), more posttraumatic growth, and a lower quality of life (on most domains) than children whose worst experience was nontraumatic. This suggests that, along with numerous indications of the impact of trauma in convenience samples, traumatic exposure shows consequences for the well-being of children in the general population as well.

However, traumatic exposure accounted for a very small part of the variation in scores in the children (the proportion of explained variance for the total model was maximally 7%). Unfortunately, studies on posttraumatic stress in children have rarely included a nonexposed reference group, which complicates comparisons. Nevertheless, in a quality of life study in severely injured children, similar small effects were reported.[39] This result may underline the fact that children typically respond well to difficult life circumstances.

Copeland et al.[1] reported that, although potentially traumatic events were fairly common in children (with an estimated life-time prevalence of 54% in children aged 9 to 13 years), they did not often result in posttraumatic stress symptoms (prevalence of PTSD, subclinical PTSD, and merely reexperiencing symptoms was 0.2%, 1.7%, and 10%, respectively, for exposed 9- to 13-year-olds).

In addition, other explanations may play a role in our finding of significant but small effects and will need to be explored in future research. First, subjective exposure rather than objective exposure to trauma may be of influence. Roussos et al.[40] observed in child victims of an earthquake that the objective exposure rate only accounted for 1.7% of variance in PTSD, while the subjective exposure rate accounted for 11%. In adolescent survivors of cancer, perceived treatment severity and life threat, but not objective disease severity, were associated with posttraumatic growth.[34] It is even imaginable that some events judged to be nontraumatic according to the DSM-IV have an impact equal to some traumatic events. For example, parental divorce may have severely distressing effects on children even when the separation is nonviolent.

Second, mediator or moderator variables could play a role in the relationship between traumatic exposure and well-being of children. Factors such as social support, appraisal of the event, and secondary stressors have been confirmed to be of influence in samples of exposed children (e.g., Udwin et al.[41]). In the general population, the experience of multiple traumas and having a history of anxiety disorders turned out to be important factors.[1] Additionally, for primary school children, the behavior of parents may be of importance.[42]

The present study adds to the existing knowledge on children's well-being in relation to traumatic exposure by elaborating on three constructs that extend beyond PTSD, and by measuring these constructs in a developmentally sensitive way in a large population sample of exposed as well as nonexposed children. Nevertheless, the limitations of the study should be taken into account. First of all, the findings rely on self-reports, whereas in mental health research, clinical interviews are seen as the gold standard for data collection. While the reason for choosing self-report was to convey attention to confidentiality and thus avoid socially desirable answers, replication of the study with clinical interviews would be valuable. Second, only the children themselves were asked to report on their reactions. Although some authors state that children themselves are the only appropriate informants for their (posttraumatic) reactions,[43] others show that parents, children, and other informants, such as teachers, can complement each other in reports.[9] It would be worthwhile to include other informants in future studies. Finally, the design of the study was cross-sectional, which makes it impossible to draw conclusions about cause and effect, and therefore warrants replication in longitudinal studies.

Posttraumatic stress reactions, posttraumatic growth, and quality of life are worth consideration in the development of prevention programs and in clinical practice. Prevention programs could take the form of specific classroom lessons about trauma and its possible consequences (including symptoms children may experience as well as the fact that most children show resiliency), serving as psycho-educational material for children and teachers. With the high life-time exposure rates in mind, such prevention programs would be no luxury. With regard to clinical practice, it would be important to start diagnostic activities with a broad perspective as opposed to an approach focused on PTSD criteria only. Clinicians should consider child-specific reactions to trauma, including both positive and negative sequelae. During the therapy itself, in addition to established therapy methods, elaborating on already existent growth experiences in children would be a worthwhile approach to enhance feelings of competency and being in control.[18]

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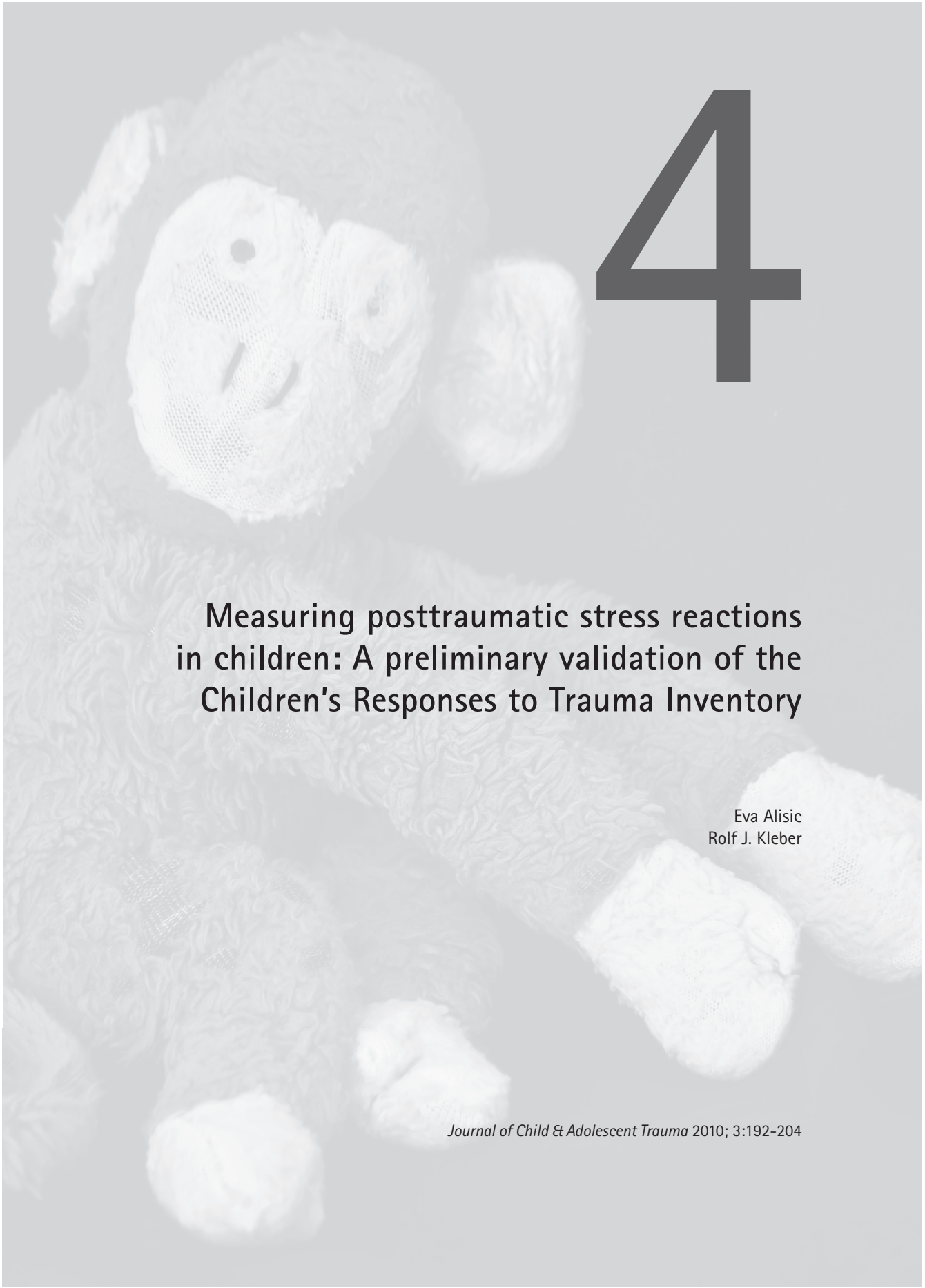

4

Measuring posttraumatic stress reactions in children: A preliminary validation of the Children's Responses to Trauma Inventory

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ABSTRACT

The Children's Responses to Trauma Inventory (CRTI) is a self-report measure for posttraumatic stress reactions in children. We validated the original CRTI through secondary data analysis of four clinical and nonclinical samples (N = 96) and expert consultation. After revision, the CRTI was further validated in 8- to 12-year-old traumatized children in the general population (N = 243). The original CRTI showed moderate to excellent reliability and both convergent and discriminant validity, but it also had limitations in formulation and scope of the items. The revised measure showed good to excellent reliability. Convergent validity was established against measures for posttraumatic stress and quality of life. These preliminary results must be confirmed in larger samples with more extensive analyses.

INTRODUCTION

Exposure to traumatic events, such as community violence, sexual abuse, life-threatening injury, and natural disasters, has been found to be a rather common experience in childhood. For example, in a recent epidemiological study in the United States, 68% of the children reported at least one traumatic experience by 16 years of age.[1] Although most children recover well from a traumatic experience, a significant minority suffers from long-term psychosocial symptoms such as intrusive memories, avoidance of activities related to the trauma, concentration difficulties, and behavioral disturbances.[e.g., 2] Left untreated, posttraumatic stress reactions can severely impair children's social, emotional, and academic functioning and increase their risk of developing disorders.[3] Therefore, timely identification of those children with high symptom levels is important.

However, validly measuring posttraumatic stress reactions in children is a challenging task. Although posttraumatic disturbances are evident in this age group, there is a continuing debate on the construct of posttraumatic stress in children. Even though the Diagnostic and Statistical Manual for Mental Disorders text revision (DSM-IV-TR[4]) is the leading guide in diagnostics, its description of posttraumatic stress disorder (PTSD) may not accurately cover children's reactions to trauma,[1] as this concept was originally developed for adults. First, although the DSM-IV-TR criteria for PTSD focus on symptoms such as re-experiencing the trauma, avoidance and numbing, and manifestations of increased arousal, children also commonly display other symptoms, such as regression, the onset of new fears, reckless behavior, separation anxiety, and psychosomatic complaints (see Kaminer et al.[2] and Yule, Perrin, & Smith[5] for overviews). Furthermore, the tripartite clustering of symptoms mentioned in the DSM-IV-TR does not appear to correspond to children's symptom profiles.[6,7] Finally, the appropriateness of the criteria for children is questioned by the finding that children with subthreshold PTSD suffer as much from functional impairment and distress as children with full-blown PTSD.[8]

To advance knowledge of the content and structure of posttraumatic stress in children, it will be necessary to have instruments covering the broad range of posttraumatic stress reactions in this age group. They should incorporate general posttraumatic responses as mentioned in the DSM-IV-TR[4] as well as other relevant, child-specific responses that are commonly observed. To date, few well-validated standardized measures exist in the field of child trauma,[9] and currently available measures often have a partial approach: they exclusively focus on PTSD criteria according to the DSM-IV-TR (e.g., the Child PTSD Symptom Scale[10]), or they neglect some of these criteria in taking a broader point of view (e.g., the Trauma Symptom Checklist for Children[11]). Although there is a continuing debate in the field of child trauma on the uniqueness of youth's posttraumatic stress symptoms and whether distinct criteria should be established, few measures of posttraumatic problems have been created specifically for children.[9] In addition, a number of measures

focus on one type of traumatic event only, which precludes general application (e.g., the Kauai Recovery Index,[12] for disasters).

There is a need for comprehensive and developmentally sensitive diagnostic tools for children's reactions to a diverse range of traumatic events. In order to satisfy this need, the Children's Responses to Trauma Inventory (CRTI; first version by Eland & Kleber[13]) has been developed. The construction of this self-report measure was mainly inspired by the social cognitive stress theory of Horowitz,[14] the description of PTSD in the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV[15]), and empirical findings from studies on children in the United States and Europe. Horowitz identified two alternating clusters of emotional reactions to trauma in adults: (a) intrusion (e.g., repeated thoughts about the event, nightmares) and (b) denial/avoidance (e.g., avoidance of locations reminding of the experience, emotional numbness). In the description of PTSD in the DSM-IV, these two clusters of reactions have been accompanied by a third one: increased arousal (e.g., hypervigilance, difficulty concentrating). In addition, empirical studies of psychological symptoms in children who were exposed to trauma provided reports of reactions such as feelings of guilt, separation anxiety, somatic complaints, regressive behavior, and recklessness.[e.g., 16-18]

Based on these theoretical and empirical notions, the authors included four subscales in the CRTI: (a) Intrusion (seven items), (b) Avoidance (five items), (c) Arousal (six items), and (d) Non-Specific Reactions (i.e., reactions not mentioned as PTSD criteria in the DSM-IV[15]; eight items, covering guilt feelings, somatic complaints, tiredness, regressive behavior, recklessness, and separation anxiety). All items were measured on a 3-point scale, and both a parent and a child version were developed. The measure was directly developed for children and has been used since then in clinical settings.[e.g., 19] Although it has a solid theoretical and empirical basis as well as clinical relevance,[e.g., 20] the psychometric quality of the instrument had not yet been examined. Furthermore, the CRTI did not appear to include all posttraumatic symptoms as mentioned in the DSM-IV-TR,[4] which would be necessary for an instrument measuring the broad range of children's posttraumatic stress reactions. Therefore, the present study aimed at (a) validating the original CRTI, (b) revising the CRTI according to the results of the validation, and (c) further validating the revised CRTI.

VALIDATION STUDY OF THE ORIGINAL CRTI

Method

The validation study of the original CRTI consisted of a secondary data analysis (to examine reliability, convergent validity, and discriminant validity) and expert consultation (to examine content validity and acquire general suggestions for improvement). The

secondary data analysis combined four data sets. The first consisted of victims of the firework disaster in Enschede, the Netherlands, that caused 22 deaths, many injuries, and substantial material damage in May 2000. Forty children filled out the CRTI at home (ages 12–18 years, *M* = 15.00, *SD* = 1.54; 40% boys[21]). The second sample included 22 children of Bosnian refugees who fled to the Netherlands during the war in the former Yugoslavia (ages 8–13 years, *M* = 9.82, *SD* = 1.59; 36% boys). The study focused on posttraumatic stress and changed role functioning in the family.[22] Fourteen children at the start of an effect study of a short intervention after a diverse range of traumatic events formed the third sample (ages 8–17 years, *M* = 11.07, *SD* = 2.81; 64% boys[23]). The fourth sample consisted of 20 girls who resided in a prison for youths convicted of crimes or held under protective custody. Most of them had experienced violence (ages 13–17 years, *M* = 15.30, *SD* = 1.08; 0% boys[24]). The children in the three clinical samples filled out the CRTI individually with a researcher or clinician present. Together, the four samples comprised 96 children (36% boys), with a mean age of 13.30 years (*SD* = 2.91).

All children filled out the CRTI as described in the introduction. In the samples of the firework disaster and the intervention study, parents additionally filled out the Child Behavior Checklist (CBCL[25]; Dutch version by Verhulst, Van der Ende, & Koot[26]). The CBCL measures behavioral problems with 118 items (on a 3-point scale) grouped into 11 subscales, forming two combined scales of internalizing and externalizing behavior. Dorresteijn et al.[21] reported Cronbach's alphas of .89, .91, and .96 for internalizing, externalizing, and total scores, respectively. In line with Yasik et al.,[27] we expected to find a stronger relationship between the CRTI and the CBCL subscale for internalizing behavior than between the CRTI and the CBCL subscale for externalizing behavior, because posttraumatic stress is assumed to be predominantly internalizing.

With regard to the expert consultation, four clinical psychologists from the Psychotrauma Center for Children and Youth (University Medical Center Utrecht) who used the CRTI on a regular basis were interviewed about items they considered missing, redundant, or too difficult. Meanwhile, one quantitative and two qualitative methodologists affiliated with Tilburg University and Utrecht University independently reviewed the measure, and via databases such as PsychInfo and Pubmed, recent literature on child-specific stress reactions was searched and consulted.[e.g., 2,28,29] In a final meeting with the clinical psychologists, consensus was reached on improvements needed for the CRTI.

Results

Percentages of high symptom levels (a score of 3) ranged from 19% (traumatic play) to 47% (startle response) indicating that every item had discriminatory power (see Table 4.1). With regard to reliability, Cronbach's alpha was .91 for the total scale, .77 for Intrusion, .58 for Avoidance, .77 for Arousal, and .77 for Non-Specific Reactions. With the exception

of the Avoidance subscale (possibly because it was a relatively short subscale), this suggested good to excellent internal consistency. Deletion of items would not result in higher alphas.

Regarding convergent and discriminant validity, Pearson's correlation between the CRTI and the CBCL subscale for internalizing behavior was .28 (p = .05; N = 50), while the correlation between the CRTI and the CBCL subscale for externalizing behavior was nonsignificant (r = .05, p = .74; N = 49), which confirmed our expectations. With regard to content validity, all PTSD symptoms of the DSM-IV-TR[4] were found to be measured by

Table 4.1 Endorsement of the original Children's Responses to Trauma Inventory (CRTI)

Item description		% Endorsement[a]	Subscale[b]
1.	Distressing recollections	21.9	IN
2.	Repetitive, intrusive recollections	28.1	IN
3.	Difficulty concentrating	20.8	AR
4.	Avoiding conversations about event	22.9	AV
5.	Physiological reactivity when reminded	35.4	IN
6.	Distress at exposure to a person involved in the event	29.2	IN
7.	Diminished interest in friendships	22.9	AV
8.	Avoiding thoughts of event	42.7	AV
9.	Frightening dreams	25.0	IN
10.	Feeling as if event recurred	20.8	IN
11.	Avoiding things, places, or people that arouse recollections	22.9	AV
12.	Feeling as if event did not happen	22.9	AV
13.	Difficulty falling or staying asleep	22.9	AR
14.	Anger; irritability	26.0	AR
15.	Startle response	46.9	AR
16.	Crying	31.2	AR
17.	Feelings of guilt	26.0	NS
18.	Somatic complaints	28.1	NS
19.	Tiredness	29.2	NS
20.	Regression	22.9	NS
21.	Anger; having fights	25.0	AR
22.	Recklessness; taking risks	24.0	NS
23.	Recklessness; not watching out	30.2	NS
24.	Separation anxiety; wish to stay close to parents	35.4	NS
25.	Separation anxiety; difficulty when parent leaves	30.2	NS
26.	Traumatic play	18.8	IN

[a] Percentages of scores equal to 3, the highest score on a 3-point scale (N = 96). [b] IN = Intrusion, AV = Avoidance, AR = Arousal, and NS = Non-Specific Reactions.

the CRTI except criteria C3, C5, C6, C7, and D4. Fear of the dark, fear of toileting at night, and a general feeling of sadness appeared to be missing from the Non-Specific Reactions. In addition, the experts considered one item of the Arousal scale (crying) a nonspecific reaction and suggested that the term *Other Child-Specific Reactions* would be more accurate than *Non-Specific Reactions*. Finally, the 3-point scale was judged too small to have optimal discriminatory power, and a few questions were found to be negatively formulated or otherwise too complex for children.

Revision

Although the structure of four subscales was maintained, four major modifications were made. First, we added the five DSM-IV criteria[15] that were lacking (C3, C5, C6, C7, and D4). Second, we renamed the subscale Non-Specific Reactions to Other Child-Specific Reactions and made the following adjustments: (a) crying was imported from the Arousal scale, (b) three items (being afraid in the dark, being afraid of toileting alone at night, and feeling sad) were added, and (c) two items measuring anxiety and recklessness twice were removed. Third, a 5-point Likert scale was chosen instead of a 3-point scale. Finally, we checked all items for simplicity and child-friendly formulation together with the experts, and multiple versions were tested with children by the four clinicians before wording of the items became definite.

The revision resulted in an instrument measuring the broad range of posttraumatic stress reactions in children with 34 items on four subscales.[30] Children are asked to indicate to what extent a reaction to a traumatic event was present during the past 7 days. Scores range from 1 to 5, with higher scores indicating more symptomatology. The subscales Intrusion, Avoidance, Arousal, and Other Child-Specific Reactions consist of 7, 11, 6, and 10 items, respectively. A sum score on all items can be computed as well as a probable PTSD classification according to the DSM-IV-TR algorithm.[4]

VALIDATION STUDY OF THE REVISED CRTI

Method

We validated the revised CRTI in a random sample of primary school children in the general population and aimed at examining reliability, convergent validity, discriminant validity, and diagnostic efficiency while providing preliminary normative data. The data were collected in the context of a larger study on children and trauma (see Alisic, Van der Schoot, Van Ginkel, & Kleber[31]; the study protocol was approved by the Medical Ethics Committee of the University Medical Center Utrecht, written informed consent was obtained from parents according to an opting-in procedure, while verbal assent was obtained from the children during data collection). From this study (N = 1,770), 243 children between 8 and 12 years

old, who described experiencing an event that was considered traumatic according to the A1 criterion of DSM-IV-TR[4] were included in the validation. Mean age was 10.48 years (*SD* = 1.22). Compared to national data[32] the number of boys was representative (52% compared to 51%; $\chi^2 = .16$, $p = .69$), but children with parents born in a foreign country were somewhat underrepresented (14% compared to 23%; $\chi^2 = 10.62$, $p < .01$) as were children in urban areas (23% compared to 42%; $\chi^2 = 54.48$, $p < .01$). Most of the children reported the loss or serious injury of a loved one (35%), confrontation with community violence (19%), disaster experiences (15%), or having survived a serious accident (13%).

All children filled out the revised CRTI, the Children's Revised Impact of Event Scale-13 (CRIES-13), and the subscale for psychological well-being from the KIDSCREEN-27 in a quiet classroom setting with the possibility of asking the researcher or research assistant questions for clarification. The revised CRTI was described in the previous section. The CRIES-13[33] (Dutch translation by Olff[34]) is based on the Impact of Event Scale (IES[35]) and measures intrusion, avoidance, and arousal with 13 items on a 4-point scale. Reliability and validity of the CRIES-13 have been shown in several studies (e.g., Perrin, Meiser-Stedman, & Smith[36]; Smith, Perrin, Dyregrov, & Yule[37]). Cronbach's alpha ranged from .60 to .80 for the subscales and the total scale, and convergent validity with depression, anxiety, and dose of exposure was found. A cut-off score of 30 maximizes sensitivity and specificity against the PTSD module of the ADIS-CP[38] with an overall efficiency rate of 83%.[36] In the present study, Cronbach's alpha was .73 for Intrusion, .73 for Avoidance, .64 for Arousal, and .85 for the total scale. We expected a strong positive correlation between the CRTI and the CRIES-13 total scores and for each CRTI subscale a strong correlation with its CRIES-13 equivalent compared to the other CRTI subscales. In addition, we expected to find sufficient diagnostic efficiency of the CRTI against the CRIES-13 (defined as a cut-off score with a sensitivity and specificity of at least 60%).

The KIDSCREEN-27[39] is a measure for quality of life in children. The subscale for psychological well-being (seven items on a 5-point scale) focuses on aspects such as being in a good mood and feeling well enough to initiate activities. The subscale has been reported to have a good reliability (Cronbach's alpha .84[40]), and convergent and construct validity have been shown in normal population samples.[41] In the present study, Cronbach's alpha was .81. As we considered the reverse of the subscale a proxy for psychological burden or clinically significant distress, we expected a strong negative correlation of the CRTI with the subscale.

Results

Percentages of high symptom levels (a score of 4 or 5) ranged from 3% (loss of interest in friendships) to 62% (avoiding thoughts about the event; see Table 4.2), indicating that almost every item had discriminatory power. Preliminary normative data for the total

Table 4.2 Endorsement of the revised Children's Responses to Trauma Inventory (CRTI)

Item description		% Endorsement[a]	Subscale[b]
1.	Repetitive, intrusive recollections	24.7	IN
2.	Distressing recollections	22.2	IN
3.	Physiological reactivity when reminded	17.7	IN
4.	Distress at exposure to something or someone involved in the event	17.7	IN
5.	Frightening dreams	20.6	IN
6.	Traumatic play	3.7	IN
7.	Feeling as if event recurred	9.1	IN
8.	Avoiding conversations about event	55.1	AV
9.	Avoiding thoughts of event	61.7	AV
10.	Avoiding things, places, or people that arouse recollections	26.3	AV
11.	Trying to deny the event	11.5	AV
12.	Detachment	7.8	AV
13.	Inability to recall important aspects of event	18.1	AV
14.	Diminished interest in hobbies	9.9	AV
15.	Diminished interest in friendships	2.9	AV
16.	Estrangement	14.4	AV
17.	Restricted range of affect	21.0	AV
18.	Sense of foreshortened future	17.7	AV
19.	Difficulty concentrating	17.3	AR
20.	Difficulty falling or staying asleep	13.2	AR
21.	Irritability	13.2	AR
22.	Startle response	20.6	AR
23.	Anger; having fights	14.4	AR
24.	Hypervigilance	23.9	AR
25.	Crying	15.6	OR
26.	Feelings of guilt	7.4	OR
27.	Somatic complaints	14.8	OR
28.	Tiredness	15.6	OR
29.	Regression	10.7	OR
30.	Recklessness	7.4	OR
31.	Separation anxiety	17.7	OR
32.	Fear of the dark	15.6	OR
33.	Fear of toileting alone at night	8.6	OR
34.	Feeling sad	14.4	OR

[a] Percentage of scores ≥ 4 on a 5-point scale (N = 243). [b] IN = Intrusion, AV = Avoidance, AR = Arousal, and OR = Other Child-Specific Reactions.

sample and for boys and girls separately are shown in Table 4.3. Concerning reliability, the internal consistency of the revised CRTI was good to excellent: Cronbach's alpha was .92 for the total measure, .79 for Intrusion, .77 for Avoidance, .71 for Arousal, and .79 for Other Child-Specific Reactions. Deletion of items would not result in higher alphas.

With regard to convergent and discriminant validity, the correlation between the CRTI total score and the CRIES-13 total score was strong ($r = .77$, $p < .01$), as were correlations between subscales that regarded the same symptom cluster ($r = .60$ for Intrusion, .61 for Avoidance, and .69 for Arousal; in all cases $p < .01$). Each CRTI subscale was associated to a higher degree with its CRIES-13 counterpart than the other CRTI subscales were, suggesting validity. The CRTI total score correlated strongly negatively with Psychological Well-Being, as expected ($r = -.55$, $p < .01$). Optimal diagnostic efficiency (84%) was acquired with a CRTI cut-off score of 91, rendering sensitivity 63% and specificity 91%.

DISCUSSION

From the present study, we conclude that the CRTI is a valuable tool for measuring posttraumatic stress reactions in children. It has a unique approach in comprising all DSM-IV-TR symptoms for PTSD[4] as well as other commonly observed child-specific posttraumatic responses. The validation study of the original CRTI (developed in 1996)[13] already yielded promising psychometric properties: (a) excellent reliability of the total scale, (b) convergent and discriminant validity, and (c) utility in various settings. Yet, it also showed room for improvement of the instrument. The validation of the revised CRTI in traumatized primary school children in the general population proved that reliability of the subscales and total scale was good to excellent and that the CRTI was valid when associated with other measures for posttraumatic stress and psychological well-being. In addition, preliminary normative data for 8 to 12-year-old children in the normal population were provided, as well as a preliminary cut-off score creating optimal diagnostic efficiency for this group against the CRIES-13.

When considering the results of this study, its limitations should be taken into account. First, the initial validation study was based on four samples that differed highly in research setting and background of respondents, possibly generating differences in answering behavior. Even though we thought that the advantage of including diverse clinical and nonclinical samples outweighed the disadvantage of a flaw in standardized assessment, we could not estimate its impact on the results. Second, although we included a large sample of primary school children in the general population, which is rare in traumatic stress studies among children, further norming should take place in adolescent and clinical samples. The present results concern 8- to 12-year-old children only. In addition, we were constricted to child self-report. The validity of the CRTI should be further established by taking into account other informants (e.g., parents and teachers) and other types of information (e.g.,

Table 4.3 Preliminary normative data of the revised Children's Responses to Trauma Inventory (CRTI) for 8 to 12-year-old children

	Total score			Intrusion			Avoidance			Arousal			Other Child-Specific Reactions		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
Mean	70.91	69.12	72.87	14.28	13.87	14.73	24.56	24.04	25.12	12.87	12.70	13.05	19.20	18.50	19.97
SD	22.13	20.77	23.47	5.68	5.66	5.70	8.04	7.97	8.11	4.96	4.91	5.03	7.06	6.34	7.74
Minimum	34	35	34	7	7	7	11	11	11	6	6	6	10	10	10
Maximum	133	119	133	35	35	32	47	47	45	30	25	30	42	37	42
Percentile 80	92	90	94	19	18	21	31	31	33	17	17	17	25	25	28
Percentile 90	106	101	109	22	22	22	36	35	37	20	20	20	30	29	32

Note. Total *N* = 243 (127 boys and 116 girls).

exploratory qualitative data, physiological data). Furthermore, although ethnic minorities and inner-city children accounted for a substantial part of the target population, they were underrepresented, and generalizations to these groups should be made with care. The same applies to children with learning disabilities and reading problems. Lastly, in validity research, it is common practice to establish construct validity by confirming the factor structure of the scale. Because of the current lack of agreement on the structure of posttraumatic stress in children (which is an important topic for future research in itself), the 'dustbin' character of the fourth subscale, and the sample size requirements for factor analysis, we focused on other forms of validity confirmation for now. Taken together, the results should be considered preliminary, and confirmation in larger samples with more extensive analyses, including factor analysis, is necessary.

As pointed out by several authors,[9,42] child trauma measures are relatively new and underresearched. Therefore, it is quite rare that normative data and cut-off scores are available for an instrument measuring posttraumatic stress in children. We advise clinicians to use the cut-off score of 91 with primary school children (8–12 years old) in order to identify children who need psychosocial care after trauma. As said previously, future research should confirm these norms (with special attention to sensitivity, which was quite low in the present study) and establish norms for the CRTI in other groups of respondents. Until these norms are provided, we suggest that clinicians use the cut-off as a rough indication that needs confirmation by other diagnostic tools.

The current debate on measuring posttraumatic stress is both quite narrow and very vigorous. It is mainly concentrated on PTSD and not on other disorders or normal development. It might be important to differentiate stress reactions after single trauma from stress reactions after chronic, interpersonal trauma.[e.g., 43] Also, it is important to realize that most children do not develop a mental disorder after serious life events, and therefore instruments should not be formulated solely from a psychopathology perspective. With regard to PTSD, researchers and clinicians still do not agree on content and structure in either adults or children.[e.g., 44-46] Studies on the structure of adult responses to trauma have yielded contradictory results. Furthermore, some researchers have even questioned the existence of PTSD, pointing out the extensive overlap with major depression and specific phobia or at least questioning the added value of the classification of PTSD. For children, because of the finding that children with full-blown PTSD suffer as much as children with subthreshold PTSD,[8] a lowering of the symptom requirements has been suggested for diagnostic purposes (e.g., one instead of three avoidance symptoms[29,46]). However, this suggestion does not respond to several indications that children's reactions diverge from the tripartite clustering of symptoms (in intrusion, avoidance, and arousal) that is thought to depict PTSD.[1,8] The divergence cannot be studied extensively when research focuses on PTSD criteria exclusively.

The CRTI provides an opportunity to further knowledge about posttraumatic stress in children because it focuses on a comprehensive range of relevant symptoms and has been developed especially for children. Although the psychometric results have to be considered preliminary, the revised CRTI offers both researchers and clinicians a broad approach to measuring posttraumatic stress in children, taking into account classic PTSD symptoms as well as other relevant reactions and assessing reactions in a child-friendly way.

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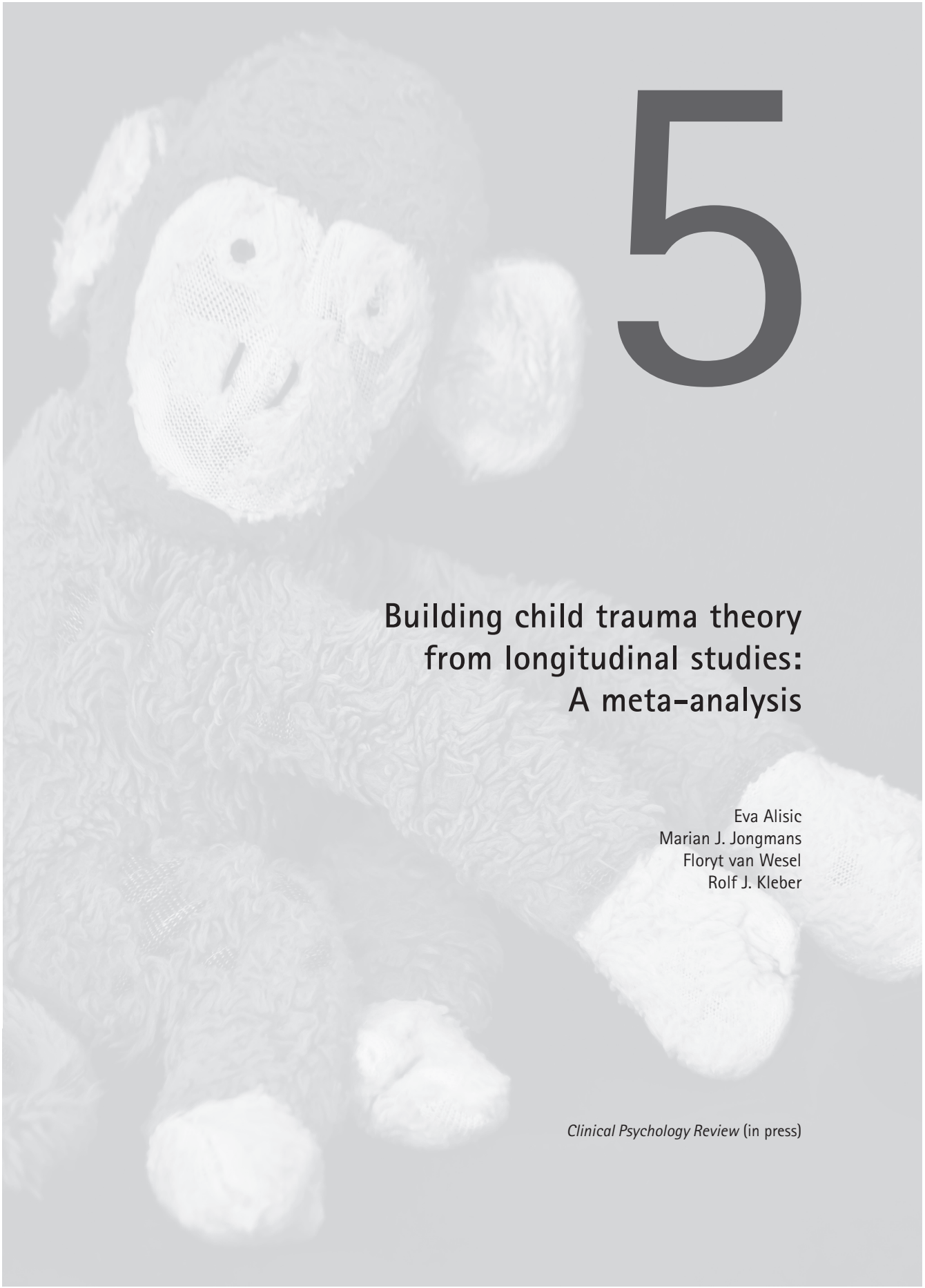

5

Building child trauma theory from longitudinal studies: A meta-analysis

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ABSTRACT

Many children are exposed to traumatic events, with potentially serious psychological and developmental consequences. Therefore, understanding the development of long-term posttraumatic stress in children is essential. We aimed to contribute to child trauma theory by focusing on theory use and theory validation in longitudinal studies. Forty studies measuring short-term predictors and long-term posttraumatic stress symptoms were identified and coded for theoretical grounding, sample characteristics, and correlational effect sizes. Explicit theoretical frameworks were present in a minority of the studies. Important predictors of long-term posttraumatic stress were symptoms of acute and short-term posttraumatic stress, depression, anxiety, and parental posttraumatic stress. Female gender, injury severity, duration of hospitalization, and elevated heart rate shortly after hospitalization yielded small effect sizes. Age, minority status, and socioeconomic status were not significantly related to long-term posttraumatic stress reactions. Since many other variables were not studied frequently enough to compute effect sizes, existing theoretical frameworks could only be partially confirmed or falsified. Child trauma theory-building can be facilitated by the development of encouraging journal policies, the use of comparable methods, and more intense collaboration.

INTRODUCTION

When children are confronted with trauma, caregivers and professionals search for ways to prevent or reduce long-term distress. Many children are exposed to traumatic events and their psychological and developmental consequences can be serious.[1] As the occurrence of severe distress after trauma appears to be a non-random phenomenon,[2] solid knowledge of risk factors, protective factors and the mechanisms by which they influence posttraumatic stress in children is needed. The purpose of this paper is to contribute to this knowledge base by focusing on theory use and theory validation in a meta-analytic approach.

Traumatic exposure involves a confrontation with actual or threatened death, serious injury, or other threat to physical integrity.[3] Examples include natural disasters, serious accidents, (mass) violence, and sudden loss of a loved one. Trauma exposure is fairly prevalent in children. Peacetime general population studies reported rates of exposure to any traumatic event from 14%[4] to more than 65%.[5,6] In addition, in a number of countries large populations, including children, are subjected to war.[7] Although it was previously thought that trauma caused only transient distress in children, it is now generally accepted that it can cause severe and long-term impairment.[8] The most studied psychological consequences of traumatic exposure in children are posttraumatic stress and its pathological extremity, posttraumatic stress disorder (PTSD[3]).

PTSD is characterized by overwhelming feelings of reexperiencing the traumatic event (e.g., nightmares and intrusive thoughts), by the avoidance of stimuli and emotional numbing (e.g., avoiding places related to the event and feeling detached from others), and by symptoms of hyperarousal (e.g., concentration difficulties and hypervigilance[3]). As was posited in the 1980s by Terr[e.g., 9] and confirmed many times since then, posttraumatic stress occurs not only in adults but also in children. Children can suffer from PTSD for many years[10] which affects their well-being and development in emotional, social, academic, as well as physical domains.[1,8,11,12]

Fortunately, most children who have been exposed to trauma do not develop PTSD. Estimations vary widely, but in a synthesis of 34 studies, 64% of the children who were exposed to trauma did not develop PTSD (Fletcher, 2003).[13] Nevertheless, about one in three children did, and several researchers suggest that subclinical levels of PTSD also cause severe impairment and distress.[14] Understanding the mechanisms underlying the considerable individual variability in psychological responses to trauma[2] is valuable both for the identification of children at risk for long-term distress and for the development of effective treatment programs. Which factors cause severe distress and which factors are levers that can be used to reduce symptoms and successfully strengthen children?

Theoretical views on posttraumatic stress in children

Although several theories have been proposed to explain the development of PTSD in adults (for an overview see Brewin & Holmes[15]) these cannot readily be applied to children. Children are thought to respond to traumatic events in a somewhat different way from how adults react (see e.g., Kenardy et al.[16]; Salmon & Bryant[17]). For example, children have a more limited knowledge base than adults. This may result in the failure to appraise an experience accurately, potentially influencing the memory of the experience and children's emotional response to it,[17] in a different way than it would influence adults. Also, children's ability to use various coping strategies to regulate emotion is likely to be influenced by their advances in development, such as their understanding of emotion (e.g., Gross & Thompson[18]; Salmon & Bryant[17]). In addition, young children appear to rely heavily on how their parents deal with stress.[19] Therefore, their adjustment to trauma is influenced differently by their environment than is adults' adjustment.

Although compared with adults little theory has been developed to understand childhood posttraumatic stress,[17] a number of conceptualizations have emerged. For example, La Greca, Silverman, Vernberg, & Prinstein[20] modeled responses to natural disaster. They identified exposure characteristics (e.g., life threat during the event and loss or disruption following the event), pre-existing child characteristics (e.g., gender, ethnicity, age), the post-disaster recovery environment (e.g., major life events, social support) and the coping skills of the child as important factors influencing children's posttraumatic reactions. Pynoos, Steinberg, and Piacentini[21] described a model that distinguishes between children's acute distress and longer-term adjustment after traumatic exposure. Short-term reactions are thought to be related to the experience of the trauma and influenced by a) proximal trauma reminders (e.g., media coverage), b) proximal secondary stresses (e.g., loss of resources), c) the ecology of the child (e.g., parental psychopathology), and d) child intrinsic factors (e.g., temperament). Children's ongoing adjustment is further related to e) ongoing reminders of the trauma, f) persistent secondary stressors, and g) related or sequential traumatization.

While the two models outlined above provide an overview of factors influencing posttraumatic stress in children, several authors have zoomed in on specific mechanisms. For example, Ehlers and colleagues[22] focused on cognitive processes and suggested that the Ehlers and Clark model[23] fits children. This model highlights the role of a) trauma memory deficits due to incomplete cognitive processing during the event and cognitive avoidance after the event, b) excessively negative appraisals of the event leading to a sense of current threat, and c) dysfunctional behaviors and cognitive strategies that are intended to control the perceived current threat but maintain the problem (e.g., thought suppression). Another illustration concerns child coping theory. While earlier coping theories dichotomized coping into a problem-focused approach, or primary coping on

the one hand, and emotion-focused, avoidant, or secondary coping on the other hand (see Compas et al.[24] for an overview), current theory assumes three or more clusters of strategies that are important in dealing with stress. For example, Ayers, Sandler, West, and Roosa[25] distinguished problem-focused, direct emotion-focused, distraction, avoidance, and support-seeking strategies. Researchers expect certain strategies to be more effective than others, depending on time point and context.[26] A final example of specific theories regards social processes. Scheeringa and Zeanah[19] have focused on parent-child interactions after trauma. They developed a theory of 'relational PTSD' and identified three dysfunctional interaction patterns between parents and young children after traumatic exposure that exacerbate children's symptoms (i.e., withdrawn, overprotective, and frightening patterns).

Several areas of trauma-focused theory that have been developed for adults, such as biological theories and theories invoking multiple representation structures (see e.g., Brewin & Holmes[15]), have not yet seen clear equivalents for children. Other, child-focused areas, such as those regarding social ecology,[e.g., 27] emotion regulation,[e.g.,18] and cognitive development (e.g., Piaget's and Neo-Piagetian cognitive stage theory, psychoanalytic theories of stages; see Miller[28] for an overview) have been developed for children in general but are rarely applied to the area of child traumatic stress.

In order to further child trauma theory and understand which factors influence post-traumatic stress and recovery, it is necessary to test current theories and build on them. Explicit theory building is an efficient method for field development in this regard.[29] When researchers explicitly describe the theoretical background of their work in the reports of their findings, this accelerates knowledge growth. Readers easily understand which theory is tested and which parts of it do or do not 'pass the test'. This stimulates focused new research that adds to these tests or develops alternatives. Therefore, for the development of a field, using theory explicitly to guide research efforts is more efficient than using it implicitly. The number of empirical studies in children who have been exposed to trauma is growing rapidly, which facilitates the task of testing current theories by synthesizing evidence.

Meta-analyses on predictors of posttraumatic stress in children

Two meta-analyses have examined predictors of posttraumatic stress in children to date.[30,31] Kahana et al.[31] looked into 26 studies in young people who had experienced accidental injuries (18 studies) or illness (8 studies). They found large to very large effect sizes for internalizing symptoms, depressive symptoms, symptoms of anxiety, dissociation, and acute stress disorder; small effects for socioeconomic status, social impairment and social support; and mixed results for age, gender, appraisal of trauma or illness severity, and life threat. Cox et al.[30] examined 14 articles on accidental injury in children (eight of which were

also included in the analysis by Kahana et al.). The strongest and most robust predictive factors accounted only for small to moderate effects. These factors were pretrauma psychopathology, female gender, life threat, and posttrauma parental distress.

These meta-analyses differ in their conclusions, implying that more research is necessary. They also have several limitations. First, they combined cross-sectional and longitudinal data. Cross-sectional estimates may provide misleading figures. For example, the appraisal of life threat may cause heightened posttraumatic stress scores but it is also possible that those children with higher stress scores are simply more prone to remembering life threat than children with lower stress scores. A second concern regards the meta-analysis performed by Kahana et al. which combined several effect sizes based on only two or three studies. Although it is true that two studies is the minimum for an average to be computed, these averages are heavily influenced by the few number of studies included, and they may be rather specific to these studies. Combined with the cross-sectional design, this may lead to over- or underestimation of effect sizes. Third, the findings of these meta-analyses are specific to the types of trauma studied (accidental injury and illness) and the research setting (hospital). Theory validation would profit from being tested across different types of trauma and different settings.[cf. 32]

Purpose of the present study

The purpose of this paper is to contribute to child trauma theory building by focusing on theory use and theory validation. For this purpose we have synthesized reports on longitudinal studies looking at recovery in children after a wide range of traumatic events. Our research questions were:

a) To what extent has longitudinal child trauma research been based on theoretical frameworks, and which theories are these?

b) To what extent have risk and protective factors in longitudinal studies been found to predict posttraumatic stress symptoms in children?

The answers will provide information on the validity of current theories, in whole or in part, and on gaps that should be addressed in future research.

METHOD

Retrieval and selection of studies

We targeted longitudinal studies depicting a natural process of recovery after trauma in children in order to shed light on relevant risk and protective factors. We defined this natural process as a situation in which some children and families will seek help and others will not,

as happens in 'normal' circumstances after trauma (samples should not be non-treatment seeking per se, but those studies that included the provision of an intervention were not selected).[cf. 33] Relevant studies were identified through systematic searches in electronic databases, reference lists (from literature reviews and from retrieved studies), and an issue-by-issue search of the *Journal of Traumatic Stress*, the *Journal of Child & Adolescent Trauma*, and the *Journal of the American Academy of Child and Adolescent Psychiatry*. The electronic databases consulted included PUBMED, EMBASE, PsychINFO, and PILOTS (a database for traumatic stress literature managed by the National Center for PTSD). Key words entered in the electronic databases were combinations of *posttraumatic stress*, *post-traumatic stress*, *traumatic event*, *traumatic experience*, and *traumatic exposure*; and *child*, *youth*, *young*, *youngster*, *kid*, *infant*, *toddler*, *preschooler*, *teen*, *teenager*, and *adolescent*. We restricted searches to empirical English-language papers published in peer-reviewed journals between 1980 (the year PTSD was first included in the DSM) and January 1st, 2010.

Papers were included in our database if they described a longitudinal study in children (i.e., child-related variables were measured at two or more time points) and satisfied the following criteria: 1) The study participants were all exposed to trauma as defined by the A1 criterion for PTSD in the DSM-IV, or separate data were shown for this subgroup; 2) The first measurement took place within three months after (the end of) the traumatic experience; 3) The last wave of the study took place at least three months after (the end of) the traumatic experience; 4) The study examined posttraumatic stress symptoms (combining at least reexperiencing and avoidance) in the participants at three or more months after (the end of) the traumatic experience; 5) The study participants were younger than 19 years old at the time of the PTSD/PTSS measurement; 6) The study did not have the evaluation of a psychological measure as its sole purpose; 7) The study participants were not recruited based on psychological characteristics (e.g., PTSD status) at either baseline or follow-up; and 8) The study did not include a psychological intervention (see Figure 5.1).

We chose the time frame of within three months (predictors) vs. three or more months (outcomes) posttrauma because we wanted to enhance the possibility that potential mediators in the relationship between trauma and posttraumatic stress were indeed related to the traumatic event and not to other (life) events. In addition, we assumed that longer-term posttraumatic stress reactions provide information about persistent problems while shorter-term posttraumatic stress reactions may remit spontaneously.[32] Measures taken at or after three months' time we refer to as 'at follow-up'.

Coding of studies

In addition to their publication details, the studies were coded according to use of theory, type of trauma, sample characteristics, posttraumatic stress measurement at follow-up, and predictors of long-term posttraumatic stress with their effect sizes. The studies were

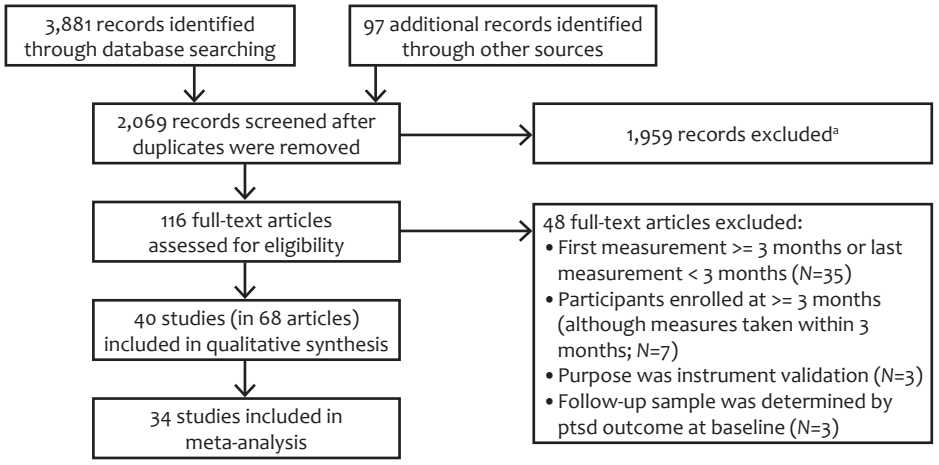

Figure 5.1 Flow-chart of the selection of studies. [a]Exclusion criteria at screening: not longitudinal; participants not all exposed to trauma or no separate data; no measurement of posttraumatic stress; participants were >= 19 years old and/or selected based on psychological characteristics; intervention study; psychometric study.

coded primarily by the first author. In addition to discussing any doubts that arose with the other authors we took several measures to ensure reliability. Before coding started, the coding scheme was tested and discussed with three researchers from University Medical Center Utrecht and a methodologist with expertise in meta-analyses on posttraumatic stress. Subsequently, the coding reliability of all variables except the associations was tested by independent coding by another researcher, from University Medical Center Utrecht. Each study had 26 or more coded variables, depending on the number of predictors and waves in the study. Reliability was calculated as a percentage of agreement between the two coders for eight studies (236 cells with 11 differences; 95% reliability). All effect size entries were verified by the third author. In addition, we contacted all authors of the original studies for correlational effect sizes (see below).

Use of theory

To gain an overview of the theoretical grounding of the studies we coded the extent to which they explicitly mentioned this grounding, and what the content was. Inspired by work from Lavee and Dollahite,[35] Pettigrew and McKechnie,[36] and Potter and Riddle,[37] we registered whether an aim was stated, whether theory was explicitly referred to in the introduction, and whether authors formulated hypotheses. We coded an aim of the study as present when words such as 'purpose', 'aim', 'objective', and 'this study sought to' were used (but not 'this study examined…' without further reference to a purpose). We coded theory as explicitly present as a basis for research when it was mentioned as

such in the article's title, in the introduction section of the abstract, or in the introduction. The theory had to be used to discuss a phenomenon and guide the research. The authors had to refer to it as theory or use key terms such as 'conceptualization', 'framework', 'grounded', 'underpinnings', or their variations. Hypotheses were coded as present when they were explicitly stated as such (e.g., with the words 'hypothesis', 'we expected'). If a study was reported in more than one eligible article, all of the articles were taken into account. In a later stage we also coded the discussion sections of the papers for explicit theory use, in order to get a complete view on explicit mentioning of theory.

Type of trauma

The primary type of trauma was coded as disaster (e.g., hurricane, flood), accidents (e.g., road traffic accidents, accidents leading to burns), war/terrorism, violence (other than war or terrorism), illness (life-threatening condition or newly diagnosed chronic disease), injury (when accidents and violence were mixed), sudden loss of a loved one, and 'other'. We registered whether the event was a collective/community experience, such as war, or an individual experience, such as an accident.

Sample characteristics

We coded several sample characteristics. First, we registered the number of eligible participants. In some medical articles families that could not be reached or were not willing to participate were excluded from the number of eligible participants; we adjusted numbers in those cases.

Second, we coded numbers and demographics of the children who initially participated. Because authors had different approaches to reporting the demographics of their samples (e.g., reporting demographics of the initial participants, of the participants retained in one or more waves, or of the eligible participants while mentioning that there were no significant differences with the initial sample), we decided to code broad demographics. For age the age range of the initial participants (within 3 months post-trauma) was coded. When necessary, we estimated age from grade levels. We categorized gender distributions as less than 40% male, 40–60% male, or more than 60% male in the initial sample. A sample was registered as 'majority Caucasian' (or other ethnicity) when 60% or more of the sample consisted of this ethnicity, otherwise the sample was coded as 'mixed'. We briefly described the socioeconomic status of individuals in the sample (e.g., income, education, depending on the original authors' definitions). Information missing after the first measurement was searched for in cross-sectional papers on the study.

Third, we coded the largest number of participants included in the follow-up for one of the effect sizes studied (see below) to be able to estimate rates at which participants were retained in the studies. In a few cases none of the effect sizes were examined

univariately in the study so we registered the largest number of participants included in a multivariate analysis. When authors carried out more than one follow-up, we selected the first wave for which we had information on associations, as earlier waves had generally larger *N*s.

Finally, we coded whether a study reported a bias in age or gender distribution in the inclusion or retention of participants (differences with regard to other demographics were seldom reported). 'Certainly age/gender bias-free' were studies explicitly reporting so for both inclusion and retention in follow-up. 'Probably age/gender bias-free' were studies explicitly reporting so for inclusion or retention but not providing information on both. All other studies were coded as 'probable or certain age/gender bias'.

Posttraumatic stress measurement

With regard to posttraumatic stress measurement we coded the timing of the follow-up (in mean number of months), which instrument was used, and who the informant was (child, parent, or both). If both parent and child reports were available, we used child reports, because several authors have suggested that parents may underreport children's symptoms.[38] Next, if results were available for both a structured clinical interview and a self-report questionnaire, we included the results of the interviews because these are generally considered better instruments for measuring psychological symptoms.[39]

Predictors of posttraumatic stress

Because follow-up *N*s were generally small and the study settings varied widely, we adopted an approach that was more conservative with regard to selecting predictors of posttraumatic stress than that of Cox et al.[30] (2008) and Kahana et al.[31] We registered all potential predictors but coded the effect sizes only for those predictors reported in at least five independent studies. Because the focus of this synthesis was on relationships between variables and these were reported as correlations in most studies, we decided to use the (univariate) product moment correlation coefficient as the effect size for the meta-analyses. We contacted all authors with a shortlist of predictors that were studied sufficiently often and asked whether they could provide us with the correlations. We received effect size information for 18 out of 40 studies (45%).

If correlations were unavailable from the papers and from the authors, we estimated them based on other univariate statistics (means and standard deviations, *F*-test statistics, Chi-square statistics, and *p*-values) provided in the articles, according to guidelines by Lipsey and Wilson.[40] In cases of non-significant findings not further specified we chose one of two options to estimate the non-significant effect size as accurately as possible: either we imputed a correlation of zero (Lipsey & Wilson[40], p.70) or we imputed the correlations that would correspond to a *p*-value of .50.[41] The former was applied when we did not

have clear expectations with regard to the direction of the association based on the effect sizes already found (e.g., for age, gender, ethnicity). The latter was applied when we expected a direction of the association (e.g., for posttraumatic stress symptoms we would not expect a negative direction but a positive one, which was also confirmed by the effect sizes already coded). In most cases for one predictor (e.g., parental distress) a single effect size was available. In the few instances that two effect sizes were given (e.g., for maternal and paternal distress), we took the average to avoid dependencies in effect sizes.[40]

Analyses

Descriptive statistics were used to summarize the studies' characteristics with regard to theoretical bases, types of traumatic exposure, samples, and posttraumatic stress measurement. With regard to effect sizes, the general approach in meta-analyses is to combine effect sizes by weighing them based on the magnitude of samples, thereby taking into account that sampling error is smaller in larger samples. Because product-moment correlation coefficients have some undesirable statistical properties (a problematic standard error formulation),[42] we combined effect sizes using Fisher-*Z* transformations as recommended by Hedges and Olkin.[43] Effect sizes and weights were combined into a weighted mean effect size with corresponding confidence intervals (95%) by means of the SPSS macros provided by Lipsey and Wilson[40] and were transformed back to a product-moment correlation coefficient for ease of interpretation.

We expected both sampling error and between-study variance to play a role in the mean effect size estimates because of the variety in types of exposure, samples and methods in the studies. Therefore, a random-effects model was applied.[cf. 44] In random-effects models total error is comprised of both within-study variance (which can be derived from the confidence intervals) and between-study variance (labeled '*v*'). If the 95% confidence interval did not include zero, the null hypothesis that the relationship between the specific predictor and PTSD symptoms was zero was rejected at the $p = .05$ level. If the relationship was significant, a higher weighted correlation would indicate a stronger association with long-term posttraumatic stress.

Publication bias (i.e., the fact that studies reporting significant effects get published more often than studies reporting smaller effect sizes) is less likely to occur in meta-analyses of predictors than in meta-analyses of treatment trials.[45] Nevertheless, we checked funnel plots with the transformed effect sizes on the X-axis and the corresponding sample weight on the Y-axis[cf. 44] and calculated a fail-safe *N* according to the formula provided by Orwin.[46] The fail-safe *N* was computed with a critical effect size of .10, which corresponds to the lower limit of a small effect.[47]

RESULTS

We retrieved 68 articles describing 40 independent studies (see Table 5.1). Four studies had been included by both Kahana et al.[31] and Cox et al.,[30] while seven were selected by one of them. We included 29 studies that had not been examined by Kahana et al. or Cox et al. Although we searched from 1980 onward, selected studies were published for the first time between 1992 and 2009, with modest peaks in 2003, 2006, and 2007 (five studies each). Most studies originated in the US (35%), followed by the UK (15%) and Australia (10%).

Theory use

Virtually all studies had a stated aim (see Table 5.2), varying from relatively broad objectives such as "Our purpose in this study was to quantify PTSD symptomatology after childhood traumatic brain injury and to identify predictors of PTSD symptomatology" (Max et al.[81], p.589) to rather specific purposes such as "Using the framework of La Greca and colleagues, our study sought to examine whether social support, discrimination, and coping predicted post-disaster mental health outcomes among youth survivors of Hurricane Katrina" (Pina et al.[127], p.565).

For slightly more than one-third of the studies (*N* = 14) theory was explicitly mentioned as a basis for research. Most often mentioned were 'overarching' models that included characteristics of the child, the stressor and the posttrauma environment (such as the model by La Greca et al.[20]). Biological theories regarding fear conditioning were referred to several times as well, followed by cognitive models (such as the model by Ehlers & Clark[23]; see Table 5.3). An example of explicit theoretical grounding was: "Guided by models of risk and resilience in the face of adversity and disasters, we examined the associations of previously unexamined emotional and social factors (i.e., fear reactivity, emotional regulatory abilities, and peer victimization) with PTSD symptoms" (La Greca et al.[20,77]; Luthar et al.[161]; Vernberg et al.[162]) by Terranova, Boxer, & Morris[123] (p.346). For 14 studies, the results were explicitly discussed in the light of theory, 11 of which also contained theory descriptions in the introduction section. The authors of three studies described theory in the discussion section only. Several studies implicitly mentioned theory without defining it as such, for example by mentioning theoretical papers only in the references. Only studies with explicit descriptions were taken into account in our coding.

Hypotheses were stated in exactly half of the studies. An example was "We hypothesized that (1) heart rate assessed at emergency department triage would be related to later PTSD outcome in traumatically injured children and that (2) the relationship between heart rate and PTSD outcome would remain significant after controlling for child age, sex, and the presence of a severe injury".[67] Seven studies (18%) stated an aim, described a theory, and formulated hypotheses for the study in the introduction section.

Table 5.1 Studies included in the synthesis

#	Article(s) Country	Theoretical basis[a]			Traumatic event	Sample			Follow-up measuring posttraumatic stress after >= 3 months				
		A	T	H		Initial *N*	Age range	% males	Timing (months post-trauma)	Instrument[b]	Informant[c]	*N*	Predictors included in meta-analysis[d]
1	Ahmad,[48] Ahmad et al.[49] Iraq	√			War: attack of Kurdish cities by Iraqi army	20	6–16	> 60%	4	PTSS-C[48]	C & P	18	G, A, P
2	Bronner et al.[50] The Netherlands	√		√	Injury/illness: Pediatric Intensive Care (PICU) admission	36	8–17	40–60%	3	CRTI[51]	C	29	G, A, I
3	Bryant et al.[52-54] Australia	√	√	√	Injury: mainly falls and road traffic accidents	76	7–13	> 60%	6	UCLA PTSD Index for DSM-IV[55]	C	62	A, Ac, I, D, H
4	Di Gallo et al.[56] UK	√			Accidents: injury due to road traffic accidents	57	5–18	> 60%	3,1	PTSD-RI[57] and R-IES[58]	C	51	G, S, Ac
5	Dyb et al.[38] Norway	√			Accident: collective tramcar accident	16	7–12	< 40%	6	CPTS-RI[59]	C	16	G, A, S, P, Pa
6	Ehlers et al.,[22] Bryant et al.,[60] Dalgleish et al.[61] UK	√	√		Accidents: road traffic accidents	86	5–16	40–60%	3	adaptation of IES[60] and RI[57]	C, (C&)P for young C	81	G, A, I
7	Karabekiroglu et al.[63] Turkey	√	√		Violence: murder at school	57	16–17	40–60%	5	CPTSD-RI[64]	C	35	G, A, Ac, Dp, Ax
8	Karakaya et al.[65] Turkey	√			Terrorism: bomb explosion nearby in Istanbul	132	12–14	> 60%	6	CPTSD-RI[64]	C	113	G

Table 5.1 continues on next page

Table 5.1 *Continued*

#	Article(s) Country	Theoretical basis[a]			Traumatic event	Sample			Follow-up measuring posttraumatic stress after >= 3 months				
		A	T	H		Initial *N*	Age range	% males	Timing (months post-trauma)	Instrument[b]	Informant[c]	*N*	Predictors included in meta-analysis[d]
9	Kassam-Adams et al.,[66,67] Dalgleish et al.[59] USA	√		√	Accidents: injury due to road traffic accidents	283	8–17	> 60%	6,4	CAPS-CA[68]	C	190	G, A, M, Ac, I, D, H
10	Kenardy et al.,[16] De Young et al.,[69] Olsson et al.,[70] Le Brocque[71] Australia	√	√	√	Accidents: injuries due to accidents (falls, RTA, etc.)	255[e]	7–16	> 60%	6	CIES[72]	C	205	G, A, Ac, I, D, H
11	Kim et al.[73] Korea	√			Accident: death of 2 mothers during fire escape drill at school	1,394	6–11	40–60%	6	CPTSD-RI[74]	C	335	G, A, Ac, P, Dp, Ax
12	Kuterovac-Jagodić[75] Croatia	√	√		War: war in Croatia	450	8–12	40–60%	17	QPTSR-C[76]	C	252	Ac
13	La Greca et al.[77] USA	√	√		Disaster: Hurricane Andrew	273	9–12	40–60%	3	PTSD-RI[64]	C	94	G, A, M
14	Landolt et al.[78,79] Switzerland	√		√	Accidents: injury due to road traffic accidents	78	6–14	40–60%	12	RI[59]	C	68	G, A, S, P, I, D, Pa
15	Mather et al.[80] Australia	√			Accidents: road traffic accidents	43	6–15	40–60%	3	CPTS-RI[59]	C	32	G, A, P, Dp, Ax
16	Max et al.[81] USA	√		√	Injury: traumatic brain injury	50	6–14	> 60%	3	K-SADS[82] present episode + supplements	C & P	38	

17	McDermott & Cvitanovich[83] Australia	√			Accidents: motor vehicle accidents	53	8–13	40–60%	3	PTSD-RI[84]	C	26	I
18	Meiser-Stedman et al.,[85-88] Dalgleish et al.[61] UK	√	√	√	Accidents/violence: motor vehicle accidents or assault	106	10–16	> 60%	6	ADIS-C[89]	C	68	G, A, M, S, Ac, I, D, Pa, Dp
19	Meiser-Stedman et al.[90] UK	√			Accidents: motor vehicle accidents	114	2–10	40–60%	6	c: ADIS[89] p: PSSIOR YC[91,f]	C P	45 60	G, A, M, Ac, I, Pa, Dp
20	Mirza et al.[92] UK	√			Accidents: road traffic accidents	125	8–16	> 60%	6,2	FRI[93]	C	113	G, A, P
21	Nugent et al.[94-96] USA		√	√	Injury: mainly accidental and miscellaneous injury	82	8–17	> 60%	6	CAPS-CA[68]	C	57	G, A, M, S, P, I, H, Pa
22	Ostrowski et al.[97,98] USA	√		√	Injury: mainly nonviolent injury	61	8–18	40–60%	7	CAPS-CA[68]	C	41	G, A, M, S, P, I, Pa, Dp
23	Pervanidou et al.[99,100] Greece	√		√	Accidents: injury due to motor vehicle accidents	60	7–18	> 60%	6	K-SADS-PL[101]	C	48	G, A, M, I
24	Qouta et al.[102,103] Gaza	√	√	√	War: First Intifada	108	10–12	40–60%	36	PTSD-RI[59]	C	83	G, A
25	Rennick et al.[104,105] Canada	√			Injury/illness: PICU admission	69	6–17	40–60%	6	Adaptation of IES[104]	C	60	
26	Rohrbach et al.[106] USA	√		√	Disaster: Hurricane Rita	602	15–16	< 40%	7	PTSD-RI[55]	C	326	G, A, M, S

Table 5.1 continues on next page

Table 5.1 *Continued*

#	Article(s) Country	Theoretical basis[a]			Traumatic event	Sample			Follow-up measuring posttraumatic stress after >= 3 months				
		A	T	H		Initial *N*	Age range	% males	Timing (months post-trauma)	Instrument[b]	Informant[c]	*N*	Predictors included in meta-analysis[d]
27	Rusch et al.[107] USA	√			Accidents: accidental mutilating facial/ extremity injuries	57	3–12	> 60%	12	Structured interview	C & P	57	G, A
28	Saxe et al.[108-110] USA	√	√	√	Accidental and non-accidental injury	235	7–18	> 60%	3	CPTSD-RI[68]	C	158	G, A, M, Ac, I[g], D, H, Pa, Dp, Ax
29	Schäfer et al.[111,112] Germany	√		√	Accidents: road traffic accidents	76	8–18	40–60%	3,2	IES-R[113]	C	69	G, A, Ac, I, Dp, Ax
30	Schwarzwald et al.[114] Israel		√	√	War: missile attacks at Israel during Persian Gulf War	492	11–16	40–60%	12	CPTSD-RI[93]	C	329	G, A, Ac
31	Shaw et al.[115,116] USA	√			Disaster: Hurricane Andrew	62	6–11	40–60%	7,4	PTSDRI[65]	C	47	
32	Shears et al.,[117,118] Garralda et al.[119] UK	√		√	Illness: meningococcal disease	78	3–16	40–60%	4,1	IES[58]	C (P for young C)	52	G, A, M, S, I, D
33	Stoddard et al.[120] USA			√	Accidents: burns	72	1–4	40–60%	4,5	CSDC-B[121]	P	11	
34	Sturms et al.[122] The Netherlands	√			Accidents: injury due to road traffic accidents	79	8–15	40–60%	3	IES[58]	C	64	

35	Terranova et al.[123] USA	√	√	√	Disaster: Hurricane Katrina	177	11–12	40–60%	8	PTSD Checklist[124]	C	152	G, M, P, Ax
36	Thienkrua et al.[125] Thailand	√			Disaster: Tsunami	371	7–14	40–60%	8,4	UCLA PTSD-RI[74]	C	119	
37	Weems et al.,[126] Pina et al.[127] USA	√	√	√	Disaster: Hurricane Katrina	225	7–18	40–60%	6,5	PTSD checklist[124]	C	52	G, A, M, S,
38	Zatzick et al.,[128,129] Ghesquiere et al.[130] USA	√		√	Injury: accidental and violent injury	108	12–18	> 60%	5,1	PTSD-RI[74]	C	90	G, A, S, Ac, P, I, D, H, Pa, Dp
39	Zehnder et al.[26] Switzerland	√	√		Accidents/Illness: accidental injury / newly diagnosed chronic disease	161	6–15	> 60%	12	RI[59]	C	128	G, A, S
40	Zink & McCain[131] USA	√			Accidents: injury due to motor vehicle accident	160	7–15	40–60%	6	DICA-R[132]	C & P	126	P

[a] Theoretical basis: A = aim explicitly mentioned in abstract/introduction, T = theoretical model(s) explicitly mentioned in abstract/introduction, H = hypotheses explicitly stated in abstract/introduction.

[b] Regards the instrument used for computing correlations in the present meta-analysis in case of more than one instrument.

[c] Informant: C = child-report, P = parent-report.

[d] Predictors: G = gender, A = age, M = minority status/ethnicity, S = SES, Ac = Acute stress symptoms (measured within 1 month posttrauma), P = posttraumatic stress symptoms (measured 1–3 months posttrauma), Dp = depressive symptoms, Ax = anxiety symptoms, I = injury severity, D = days in hospital, H = heart rate, Pa = parental acute or posttraumatic stress symptoms.

[e] Approximate number.

[f] Because measures differed according to age group and separate statistics were available, these groups were regarded as independent subsamples in the analyses. Correlations were available for the same predictors in both groups, except for depressive symptoms (only available for child-report).

[g] For injury severity, different measures (i.e. percentage of body surface burnt and injury severity score) were used for two independent subsamples (N = 51, N = 100); these were regarded as such in the analyses. For the other predictors, information available regarded the complete sample.

Study characteristics

The summary of study characteristics is shown in Table 5.2. Accidents were studied most frequently, followed by accidental injury/violent injury/life-threatening illness combinations, disaster, war or terrorism, other violence, and life-threatening illness alone. In total, 26 studies focused on individual experiences (all were carried out in hospital settings) and 14 studies examined collective experiences (all were carried out in community settings).

Studies targeted populations ranging in number from 18[38] to 1,456[73] children during their first wave. The total number of initial participants was 7,039. The mean response rate was 71% (for 30 studies reporting the number of eligible participants). Children's ages ranged from 1 to 18 years old, with children aged 8, 9, 10, 11, or 12 years old studied most often (>75% of studies for each age year), followed by children aged 7, 13, 14, 15, or 16 years old

Table 5.2 Synthesis of study characteristics

Characteristic	*N* (% / *M* / *Mn* / *SD*)		(Range)
Theory			
Aim	37 (93%)		
Explicit theory	14 (33%)		
Hypotheses	20 (50%)		
Settings			
Accidents	17 (43%)		
Traumatic injury	10 (25%)		
Disaster	6 (15%)		
War/terrorism	5 (13%)		
Other violence	1 (3%)		
Illness	1 (3%)		
Samples			
Eligible participants	≥ 8,922[a]		(18–1,456)
Included participants	7,039	(*M* = 176, *Mn* = 84, *SD* = 239)	(16–1,394)
Participation rate	*M* = 71%[b]	(*SD* = 21,1)	(31%–100%)
Participants in follow-up	4,000	(*M* = 100, *Mn* = 68, *SD* = 85)	(11–335)
Retention rate of eligible participants[c]	*M* = 49%	(*SD* = 19,4)	(11%–89%)
Retention rate of initial participants[d]	*M* = 71%	(*SD* = 21,2)	(15%–100%)
Timing of follow-up	*M* = 6,9 months	(*SD* = 5,65)	(3–36)
N ≥ 100 at follow-up	14 (35%)		
Certainly bias free	11 (28%)		
Probably bias free	14 (35%)		

Note: *M* = mean; *Mn* = median; *SD* = standard deviation; total *N* = 40.

[a] Unknown for *N* = 10; for these studies the number of initial participants was taken as an indication of minimum eligible *N*.

[b] Unknown for *N* = 10.

[c] Percentage of eligible participants retained in follow-up; unknown for *N* = 10.

[d] Percentage of initially included participants retained in follow-up.

(50–75% of studies). In most studies (58%) gender was fairly equally distributed; a number of studies were dominated by boys (38%). In 20 studies ethnicity or majority/minority status was described; of these studies, 12 (60%) had a predominantly Caucasian sample, one (3%) a predominantly Asian sample, one (3%) a predominantly Arab sample, and six (15%) had a mixed sample. The socioeconomic status of the children in the sample was described in some way in 18 studies (45%) and ranged from poor (e.g., poor neighborhoods, low

Table 5.3 Use of theory

Study (first author of first publication)	Theoretical models explicitly mentioned[a]
Bryant et al.	Cognitive models[23,133] Fear conditioning models[134]
Ehlers et al.[b]	Cognitive models[23]
Karabekiroglu et al.	Multivariate models[135,136]
Kenardy et al.[b]	Fear conditioning models[137,138] Models of symptom trajectories and resilience[32,139]
Kuterovac-Jagodić[b]	Model of characteristics of child, stressor, and posttrauma milieu[140]
La Greca et al.[b]	Model of characteristics of child, stressor, and postdisaster environment[e.g., 20,141]
Meiser-Stedman et al.[b]	Cognitive accounts in adults[e.g., 23,142] Conceptualizing pathology in younger populations with a different algorithm[e.g., 143,144]
Nugent et al.[b]	Three-factor model of PTSD[145] Three models on development of emotional numbing, regarding avoidance, depression, and fear conditioning[146] Biological theories of PTSD[e.g., 147 in adults, 148 in youth]
Qouta et al.[b]	Concept of flexible perception[149] Psychoanalytical ego theory regarding personality styles that affect behavior in stress situations[150] Coping/emotion theory[151,152]
Saxe et al.[b]	Proposal concerning overconsolidation of traumatic memory[153] Animal model of traumatic memory and PTSD[134,154]
Schwarzwald et al.[b]	Stress evaporation approach[e.g., 155 for adults, 156 for children] Residual stress approach[e.g., 157 for adults, 158 for children]
Terranova et al.[b]	Models regarding adjustment following disaster exposure and stressful environments[e.g., 20,77]
Weems et al.[b]	Framework first articulated by e.g., Green et al.[141] and La Greca and colleagues[e.g., 20] concerning aspects of traumatic exposure, pre-existing characteristics of the child, characteristics of the postdisaster recovery environment, and child psychological resources.
Zehnder et al.	Coping theory[159,160]

[a] When three or more references were given, we show two published examples.

[b] These studies also explicitly mentioned theory in the discussion or comments section of their paper(s). In addition, Ostrowski et al., Pervanidou et al., Rohrbach et al., and Zatzick et al., mentioned theory in the discussion or comments sections only. In total, 14 out of the 40 studies (35%) explicitly discussed their findings in the light of theory.

income) to mixed (e.g., families with incomes or education ranging from lower to upper class). Fourteen studies (35%) had a follow-up *N* >= 100 and four studies (10%) reached at least 70% of the initially eligible participants at follow-up. Eleven studies (28%) mentioned that there was no bias with regard to the gender and age distributions in inclusion and retention. The majority of the studies reported either did not provide information on inclusion and retention bias with regard to gender and/or age, or reported such a bias.

The initial follow-up took place up to 36 months after the event, with a mean of seven months. The UCLA Children's PTSD Reaction Index for DSM-IV[55] or one of its earlier versions (see Steinberg, Brymer, Decker, & Pynoos[74] for an overview) was used most frequently to measure associations with predictors (50% of studies), followed by the Children's Impact of Event Scale[163] or one of its earlier versions or adaptations (18% of studies). Note that a few studies also measured stress symptoms with parental interviews or child self-report questionnaires that we did not take into account because child measures or child interview scores were available respectively.

Predictors of long-term posttraumatic stress in children

We initially registered more than 50 different potential predictors of posttraumatic stress at follow-up. Variables ranged from very general (e.g., prior psychopathology, life events since trauma, intellectual capacity, social support) to very specific (e.g., number of X-ray pictures taken while in hospital, parental history of trauma, whether a child was immobilized in the ambulance). For twelve predictors we had sufficient information (i.e., data from at least five independent studies) to analyze the effect sizes. These were gender, age, minority status, socioeconomic status, injury severity, duration of hospital stay, heart rate shortly after hospital admission, acute stress symptoms (<1 month posttrauma), short-term stress symptoms (1–3 months posttrauma), symptoms of depression, anxiety symptoms, and parental posttraumatic stress symptoms (0–3 months posttrauma; see also Table 5.1). For both minority status and gender we performed analyses with point biserial correlations. We distinguished between acute and short-term posttraumatic stress symptoms for the children, parallel to Acute Stress Disorder and Acute Posttraumatic Stress Disorder conceptualizations.[3] This was not possible for parental posttraumatic stress because of a smaller number of relevant studies.

For six studies we could obtain only multivariate statistics. Therefore, the total number of studies that contributed to the meta-analysis was 34. Funnel plots did not show highly skewed distributions of effect sizes. For the interpretation of the effect sizes, we applied Cohen's criteria, which define a correlational effect of .10 as a small effect, .30 as a medium effect, and .50 as a large effect.[47] Table 5.4 shows, for each predictor, the number of individuals involved, the number of studies included, the weighted effect size *r*, the lower and upper limit of the 95% confidence interval, the between-studies variance (v), and the fail-safe *N*.

Table 5.4 Meta-analysis of predictors of posttraumatic stress symptoms in children

Predictor	*N*	*K*	Weighted *r*	*p*	Weighted CI Lower limit	Weighted CI Upper limit	*v*	Fail-safe *N*
Gender	3,195	31	.13	<.01	.08	.17	.01	8.4
Age	2,940	29	-.01	.78	-.07	.05	.02	
Minority status	1,308	13	.09	.20	-.05	.23	.05	
Socioeconomic status	888	11	-.07	.10	-.16	.02	.01	
Injury severity	1,381	18	.09	.02	.01	.16	.01	
Days in hospital	889	8	.18	.02	.03	.33	.04	6.5
Heart rate	658	6	.18	<.01	.08	.27	.00	4.6
Acute stress symptoms[a]	1,857	14	.51	<.01	.43	.59	.03	57.7
Posttraumatic stress symptoms[b]	1,196	12	.56	<.01	.44	.66	.06	55.3
Depressive symptoms	813	9	.48	<.01	.32	.61	.06	33.8
Anxiety symptoms	745	6	.44	<.01	.31	.57	.03	20.7
Parental acute/posttraumatic stress symptoms	515	9	.34	<.01	.24	.43	.01	21.4

Note: *N* = number of children included in effect size; *K* = number of samples; Weighted *r* = weighted correlation according to random-effects model; *CI* = 95% confidence interval; *v* = between-study variance.

[a] Measured within one month posttrauma.

[b] Measured one to three months posttrauma.

Five out of the twelve predictors significantly and moderately/strongly related to long-term posttraumatic stress reactions in children: acute stress symptoms (0–1 month posttrauma; weighted *r* = .51), short-term posttraumatic stress symptoms (1–3 month posttrauma; weighted *r* = .56), parental posttraumatic stress symptoms (weighted *r* = .34), depressive symptoms (weighted *r* = .48), and anxiety (weighted *r* = .44). This implies that the greater a child's acute or short-term stress symptoms are, the greater the long-term posttraumatic stress symptoms will be, and that this relationship is strong. Likewise, but to a somewhat lesser extent, children's anxiety, depressive symptoms and their parents' symptoms predict subsequent posttraumatic distress. These findings are fairly robust; 20 to 57 studies reporting a correlation of zero would be needed to make the weighted effect size drop to the lower bound of a small effect (*r* = .10).

Four predictors yielded significant but small mean effect sizes: gender (weighted *r* = .13), injury severity (weighted *r* = .09), hospital stay in days (weighted *r* = .18), and heart rate shortly after admission to the hospital (weighted *r* = .18). On average, girls, more severely injured children, children who were hospitalized for a longer period, and children with a higher initial posttraumatic heart rate demonstrated more posttraumatic stress reactions in the long run. Four to eight zero-effect studies would be needed to lower the mean effect sizes for gender, hospital stay and heart rate to .10; conclusions about these predictors are less firm than those about the moderate/strong predictors. Note that for injury severity, the mean effect size was already smaller than the criterion for the fail-safe *N*, and therefore the fail-safe *N* was not computed.

Three predictors were non-significantly related to long-term posttraumatic stress reactions in children: age, minority status, and socioeconomic status. Their weighted effect sizes were -.01, .09, and -.07 respectively.

DISCUSSION

The purpose of this paper is to contribute to child trauma theory building by focusing on theory use in longitudinal studies and on theory validation based on the findings of these studies. We retrieved 40 studies published in the last 30 years that examined predictors (within three months posttrauma) of long-term posttraumatic stress (at three or more months posttrauma) in children. We summarized their use of theory, study characteristics, and the correlational effect sizes for 12 predictors. One of the main findings was that explicit theoretical frameworks were present in a minority of the studies only. When theory was explicitly referred to, general risk factor models, biological theories, and cognitive models were most present. The most notable predictors of long-term posttraumatic stress were symptoms of acute and short-term posttraumatic stress, depression, anxiety, and parental posttraumatic stress. Female gender, injury severity, duration of hospitalization, and heart rate shortly after admission to the hospital accounted for small effects. Age,

minority status, and socioeconomic status were not significantly related to long-term posttraumatic stress reactions in children.

Strengths and limitations

The present paper adds to the literature in several ways. With regard to theory use, we are unaware of any other systematic review of theoretical grounding of child trauma studies. This is new to the field. With regard to theory validation, the present analysis considerably broadens earlier work. The meta-analyses by Kahana et al.[31] and Cox et al.[30] included studies on injury and illness only and all samples were hospital-based. The present analysis took into account the complete range of traumatic events as defined by the DSM-IV as well as samples approached in a variety of settings. Also, the earlier meta-analyses mixed cross-sectional and longitudinal findings, which may lead to over- or underestimation of the effect sizes, while we selected longitudinal studies only. They included smaller numbers of studies in their analyses and reported contradictory findings. Our analysis sheds new light on these issues and also included new predictor variables. Finally, this meta-analysis adds to the literature by identifying gaps in research with regard to testing child trauma theory.

Meanwhile, several limitations of this study should be kept in mind. First, longitudinal child trauma studies are still relatively rare. Our sum *N*s were rather small for some predictors. The scarcity of studies compelled us to use simple univariate statistics since similar approaches in multivariate analyses are not yet commonplace. Although univariate relationships are important building blocks for more complicated models, these relationships are obviously simplifications of complex, multivariate processes.

A second limitation regards conclusions about causality. Even though focusing exclusively on longitudinal findings brings us a step closer to knowledge about factors causing or moderating long-term distress after trauma than including cross-sectional findings would do, it does not allow any firm conclusions as we did not systematically manipulate these factors in experiments, or examine studies that did so. For ethical reasons this is possibly the closest we can get since we do not want to purposely traumatize children (although a few authors were 'lucky' enough to study child traumatic stress in a natural experiment when disaster struck after they had examined various psychological characteristics of the children in their study).

Another limitation of the current study relates to the decisions we made. We may have influenced the results by our definition of theory use, the choice of correlations as the effect size, the preferences for the informants of symptoms, the decision to contact authors, and the requirement that predictors were measured shortly after exposure, to name a few reasons. We expect that our conclusions about the medium and strong effects will not be affected by these choices, but they could affect the less-robust results and confirmation by other systematic reviews will be necessary.

Fourth, we did not include studies measuring outcomes other than posttraumatic stress, such as generalized anxiety disorder, major depression, and posttraumatic growth. Anxiety and depression have overlapping symptoms with posttraumatic stress disorder but also have distinctive symptoms that we could not account for. The mechanisms related to positive outcomes (e.g., posttraumatic growth, resilience) are probably different from those connected to posttraumatic stress.[32] Therefore, generalizations of our findings should not be made to psychological consequences other than posttraumatic stress symptoms.

Theory use

"Few people other than theorists ever get excited about theories" (Toracco[164], p.114). In the empirical child trauma field we may indeed suffer from a lack of theorists: only a minority of the longitudinal studies included was driven by explicit theoretical considerations. Although the relative youth of the child trauma field[165] could be a reason, Toracco suggests that the predominance of non-theoretical research is a more general phenomenon. Indeed, it exists in established fields as well. For example, Hawley and Geske[166] found only 42% of 95 articles on family therapy research that referred to theory explicitly.

Since a lack of theory-centeredness is not the privilege of young fields, child trauma theory and empirical research run the risk of remaining somewhat separate entities, at least at an explicit level. This is a serious shortcoming since theory serves a variety of purposes directly related to empirical research and interventions, such as interpreting new research data, responding to new problems, evaluating solutions, discerning priorities, interpreting old data in new ways, and identifying new research directions.[167] Or, as Lewin[168] succinctly put it: "Nothing is as practical as a good theory" (p.129). Theory moves a field forward, expecially when it is made explicit.[cf. 29]

Currently, theory building is not optimally stimulated in the scientific community. For example, some journal policies communicate non-theoretical interests. Several high-impact journals, in (general and psychiatric) medicine, prefer short introductions. This encourages authors to point only to the relevance of the topic, some earlier research, and the purpose of the present study (see e.g., Thienkrua et al.[125]). More generally, empirical papers tend to emphasize highly sophisticated methods instead of comprehensive theoretical grounding, while both should be considered important. Finally, variables tend to be studied because they are easily available instead of being chosen based on theory. Focusing on specific variables to confirm or falsify theory would further our knowledge faster.

Although they were a minority, several authors in our study based their work on theory, predominantly on general risk factor models,[e.g., 20] biological theory,[e.g., 137] and cognitive theory.[e.g., 23] It is striking that these longitudinal studies borrowed far more from general trauma theory than from child (i.e., developmental) theory. Developmental theories (see Miller[28] for an overview), were absent. This is in line with Pat-Horenczyk, Rabinowitz, Rice,

and Tucker-Levin[169] who argued that "most current conceptualizations of childhood PTSD are some distance away from a genuinely developmental approach" (p.62). The theoretical grounding the authors used had its reverberations on the variables tested in the studies.

Theory validation

Based on our meta-analysis, conclusions can be drawn regarding the validity of parts of the models mentioned in the introduction. General risk models[e.g., 20,21] describe characteristics of the stressor, the child, and the child's environment as influencing children's posttrauma adjustment. Our findings suggest that certain child demographics (age, minority status, socioeconomic status) need to be emphasized less as important risk factors. They may, however, play a moderating role that we were not able to examine in the present analyses. In addition, although we did not find an association with the number of children's posttraumatic stress symptoms, age (as an index for development) could still be related to the quality of these responses, as has been suggested by Salmon and Bryant.[17] For example, children may show the same number of symptoms but with different patterns than adults, or children show other symptoms not included in standard PTSD instruments, such as regression and separation anxiety (see e.g., Kaminer, Seedat, and Stein[170]). Child characteristics other than demographics, such as academic skills and pre-trauma anxiety, should be studied more frequently in order to draw robust conclusions. The same applies to life threat during the event, loss/disruption following the event (stressor characteristics), major life events and social support (characteristics of the environment), and coping, the other variables put forward in the models. In contrast, in line with Pynoos' model, acute stress symptoms and biological reactions (increased heart rate) appear to be related to later stress symptoms. In sum, the overarching models could be partially confirmed. Some elements can be removed and most elements remain to be tested.

One of the more specific theories we described regarded the cognitive model by Ehlers and Clark[23] that focuses on trauma memory deficits, appraisals, and PTSD-maintaining behaviors and cognitive strategies. Although, for example, the appraisal of life threat may play an important role in the development and maintenance of posttraumatic stress in children,[e.g., 22] we were unable to quantify this relationship. Coping models applied to the field of traumatic stress[e.g., 26] also await testing in future meta-analyses. Only a few studies have examined the effects of coping. It would be valuable to discover which coping styles are related to increased or decreased levels of posttraumatic stress.

Even though the relational PTSD model formulated by Scheeringa and Zeanah[19] was never explicitly described as a basis for research in our set of studies, our findings suggest that this model merits future attention. The specific mechanisms by which parental stress symptoms influence children's post-trauma adjustment (such as overprotectiveness vs. being unavailable) could not be tested in the present study but parental distress was

found to be a significant predictor of children's distress. Our findings indicate that this relationship exists not only with very young children, as has been described in research by Scheeringa and Zeanah, but also in older age groups.

Biological theories were only briefly mentioned in the introduction to this paper because they have not yet focused on children to a significant extent. However, they were quite prevalent in the studies included in the meta-analysis. Fear conditioning models posit that exposure to a traumatic event leads to a strong fear reaction which becomes conditioned to many stimuli associated with the traumatic event. Stress hormones "released at the time of the trauma, marked by an increased heart rate, are thought to contribute to fear conditioning and overconsolidation of trauma memories" (O'Donnell et al.[137], p.256). The current analysis appears to confirm these propositions, as an increased heart rate was found to predict subsequent stress symptoms.

In summary, many proposed relationships await testing. Although both Pat-Horenczyk et al.[169] and Layne et al.[32] posited that the era of "studying shopping lists" of variables has ended, this is not because of any overwhelming evidence regarding the variables on these shopping lists. We agree with these authors, however, that more advanced methods to study trajectories of symptoms, such as growth mixture models, are now available and should be used. Meanwhile, even if few predictors were analyzed in the present study, it has shown that future theoretical models need to focus on factors proximal to the trauma (e.g., initial physiological arousal, acute stress reactions, parental distress) compared to factors distal to trauma (e.g., demographics), as has been posited by Ozer et al.[2]

Our findings provide new insights to the results of earlier meta-analyses by Cox et al.[30] and Kahana et al.[31] (see Table 5.5). We converted the findings of Kahana et al. (Cohen's *d*) to *r* and applied Cohen's rule of .10 being a small effect[47] as a rule of thumb to identify differences. The two earlier analyses showed highly variable findings for gender (ranging from .04 to .22) and age (ranging from -.48 to .04), in considerably smaller number of studies (maximum 15 vs. 31 and 29 in our study). We found a small effect for gender and no effect for age. We found no effect for socioeconomic status based on 11 studies where Kahana et al. reported a small effect based on three studies. Kahana et al. reported variable effect size ranges for depressive symptoms (.47 to .62; 3 studies) and anxiety symptoms (.41 to .70; 4 studies). We found the effect sizes to be on the lower side of these ranges (.48 and .44 respectively, for 9 and 6 studies), which may have to do with the difference between longitudinal and cross-sectional measurements. The findings regarding injury severity, acute and short-term posttraumatic stress, and parental distress were similar, whereas our findings with regard to minority status, duration of hospitalization, and heart rate were new.

Although the included studies varied widely in samples and methodology, the research base was dominated by studies carried out in medical settings, studies in children aged 8 to 12 years old, and studies with relatively small follow-up samples. It would be valuable to

Table 5.5 Comparison of the results of meta-analyses on predictors of posttraumatic stress in children

Predictor	Alisic et al.		Cox et al.[a]		Kahana et al.[b]	
	K	Weighted *r*	*K*	Weighted *r*	*K*	Weighted *r*
Gender[c]	31	.13	8	.18 (1st)	15	.09 (inj)[d]
			5	.22 (f-u)	6	.04 (ill)[d]
Age	29	-.01	7	-.04 (1st)	15	.04 (inj)
			3	-.12 (f-u)	7	-.48 (ill)
Minority status[e]	13	.09				
Socioeconomic status	11	-.07			3	-.22 (inj)
Injury severity	18	.09	5	.09 (1st)		
			4	.08 (f-u)		
Days in hospital	8	.18				
Heart rate	6	.18				
Acute/posttraumatic stress symptoms	14	.51 (acute)			2	.43 – .56 (inj)
	12	.56 (pts)				
Depressive symptoms	9	.48			3	.47 – .62 (inj)
Anxiety symptoms	6	.44			4	.41 – .70 (inj)
Parental acute/posttraumatic distress	9	.34	5	.29 (1st)		
			3	.41 (f-u)		

Note: *K* = number of samples.

[a] Cox et al.[30] summarized effect sizes for initial (1st) and follow-up (f-u) measurements separately.

[b] Kahana et al.[31] summarized effect sizes for studies regarding injury (inj) and illness (ill) separately. We converted Kahana et al.'s findings to *r* for this comparison.

[c] A positive correlation corresponds with female gender.

[d] This appears to be a correlation with full PTSD in a dichotomous way. Correlations with 'partial PTSD' are higher: .50 and .88 for studies examining injury and illness respectively.

[e] A positive correlation corresponds with having a minority status.

truly cover a range of settings and ages, in order to understand similarities and differences between them. This would enable a more thorough understanding of whether a general trauma theory is indeed possible, whether specific theories for specific types of trauma are necessary, or whether a modular theory (e.g., with a common 'core' and theoretical modules specific to the type of trauma that is addressed) would fit best.

In addition, it was striking that risk factors such as stress symptoms were studied far more often than protective factors. A quick search in the PILOTS database for all types of empirical papers on *children* and *risk factor* or *protective factor* yields about four times more publications on risk factors than on protective factors. Identifying protective factors is important for the development of programs to prevent and treat long-term posttraumatic stress in children. [cf. 171] Although the numbers are still small, recent publications indicate that the field is slowly but surely moving toward balanced attention given to both negative and positive aspects of traumatic stress in children (see e.g., Kilmer & Gil-Rivas[172]; Layne et al.[32]).

Practical implications

The findings of this meta-analysis have several implications for clinical practice. First, it will not be possible to easily identify children at risk for long-term distress based on a few demographics and exposure criteria. Earlier *psychological* symptoms provide the best indicators when predicting posttraumatic stress symptoms. Differences between the predictive strength of stress symptoms measured within one month (r = .51) and one to three months (r = .56) are small, which may encourage clinicians to measure this factor as early as possible to identify children at risk. This is, however, not in line with the guidelines of the United Kingdom's National Institute for Health and Clinical Excellence,[34] which recommend 'watchful waiting'. Early screening for stress symptoms could enable early interventions. However, early interventions such as debriefing are generally not recommended, although they have rarely been studied in children.[e.g., 173] In our view, there may be good alternative early interventions that do not follow the debriefing format. For example, when a child has been identified as being at risk, an intervention focused on activating social support and/or preparations to engage the child in therapy could be started. The effects of these interventions would obviously have to be studied.

Although early stress symptoms are the best indication of later distress compared to the other predictors we studied, they only account for 26–31% of the variance in long-term stress symptoms. Therefore, other predictors should also be taken into account when screening children. Symptoms of anxiety and depression are found to be informative, but it is quite possible that these do not explain substantial additional variance since there are overlapping symptoms. A more separate, important indication is parents' posttraumatic stress. In addition, in medical settings, injury severity, length of hospital stay (or one of both as they will probably overlap) and heart rate will add to the accuracy of a screening tool.

A screening tool that has been developed for the medical setting and that includes some of these variables is the STEPP (Screening Tool for Early Predictors of PTSD).[174] Several of its variables, such as separation from parents during an incident and injury or death of someone else in an accident could not be confirmed by the present analysis, but Winston et al.[174] showed the overall performance of the measure to be good. Developing similar tools for other settings will be valuable.

Finally, if the factors that are found to be moderate/strong predictors are also actually causal influences on long-term posttraumatic stress, this has implications for treatment. The factors found to be most strongly related to posttraumatic stress are potentially modifiable. In line with clinical impressions, it appears to be highly important to include parents in treatment.[39] Interventions for traumatized children that focus on parents or parenting have rarely been studied[175] and deserve more attention. There is a trend towards looking more specifically at the family and social environment of children and possible interventions, which will contribute to further theory building.

Theory building

There are four important trends that will be significant to building child trauma theory in the next few years. First, there is a trend toward looking beyond PTSD, as was mentioned above. Authors increasingly look at positive outcomes, such as resilience and posttraumatic growth and to broader constructs, such as self-regulation (see e.g., Brom, Pat-Horenczyk, & Ford[176]; Kilmer & Gil-Rivas[172]). This enables an approach that is more wellness-oriented[177] instead of pathology-oriented.

Second, authors are increasingly looking beyond single predictors.[169] As Layne and colleagues[32] (p.15) put it: "because people's risk factors and coping resources seldom operate or travel in isolation, the practice of examining risk and beneficial factors one at a time both decontextualizes the object of study and misses the broader point". While at this moment decontextualization is necessary for comparisons, as in the present analysis, in the future we may be able to compare more complex sets of factors.

Third, related to the tendency to look at aggregates of factors is a development toward looking beyond linear relationships in psychology. Non-linear dynamical systems theory[178] proposes that certain changes are far from gradual. When the challenges to a current steady state are too great to assimilate, change is characterized by sudden disturbance and increased variability in the 'systems' behavior before reorganization (Hayes et al.[176], p.716). Within this increased variability, several individual trajectories of adaptation[32] can be predicted. A first application of the study of individual trajectories after trauma in children was carried out in one of the studies in our synthesis.[71]

Fourth, there is a more general tendency to look beyond the individual. In child trauma literature, the family has been getting more attention. This applies not only to the role of parents[169] but also to the influence of and on siblings.[e.g., 180] In addition, although it is not yet prominent in trauma theory, network theory has gained attention. (Social) network theory is related to dynamical systems and chaos theory, and focuses on systems of interacting components. For example, Christakis and Fowler[181] studied the person-to-person spread of obesity and concluded that obesity travels through social ties. Similarly, posttraumatic reactions may develop in families and communities.

One important tendency is lacking in these trends: a trend towards a more developmentally oriented trauma theory is not yet apparent (with the exception of models regarding very young children, see e.g., Scheeringa and Zeanah[19]). As has been posited by Salmon and Bryant[17] (see the introduction), there is a need to understand the impact of children's developmental stages on their trajectories of recovery after trauma. Although the present analyses did not show a univariate correlation with the level of posttraumatic stress symptoms, the mechanisms of trauma processing in children are thought to be qualitatively different from those of adults,[17] and child-specific surrounding factors, such as parents,[19]

turn out to play an important role. Therefore, the development of child trauma theory should be facilitated.

Facilitating child trauma theory building

In our view, child trauma theory building could be facilitated in three areas: publication policy, methodology, and collaboration. Above, we described that the scientific community is not optimizing its research potential for theory building. Journal policies could encourage the building of theory more strongly. Several journals require authors to provide key points: 'What is already known' and 'What this study adds'; a simple solution would be to have authors show in addition 'How this study builds theory'. Beyond the policies of the top journals, funding organizations could require theory building. There is a growing trend towards funding those projects that have clear practical implications, but theory building could equally be stimulated.

In order to enhance theory building, theory not only has to be conceived and described. It must also be tested, in a thorough manner. The current study showed that more and more comparable longitudinal research is needed. Several interesting factors, such as coping, social support, and the appraisal of life threat, have not yet been studied extensively enough. There is a great deal of fragmentation in constructs examined and measures used. More diversity is needed, since the current longitudinal database is dominated by medical studies. In order to generate theoretical frameworks that apply to children who are confronted with any trauma, develop theories for specific settings, or construct a modular theory (see above), it would be valuable to focus on children in non-hospital settings as well.

Finally, collaboration is a necessary foundation for building child trauma theory. As the models by Pynoos et al.[21] and Layne et al.[32] show, there are many domains and disciplines to cover, and especially exploring the possibility of integrating theories would be valuable. Child trauma theory would benefit from more thorough collaboration between scholars. The National Child Traumatic Stress Network in the United States is a fine example of such collaboration, but this endeavor would need to be more international. One way to build more collaboration would be to have theory discussion meetings at international trauma conferences, rather than one-way presentations. Collaboration would make it possible to influence journal policies, to exchange ideas, and to reach larger samples.

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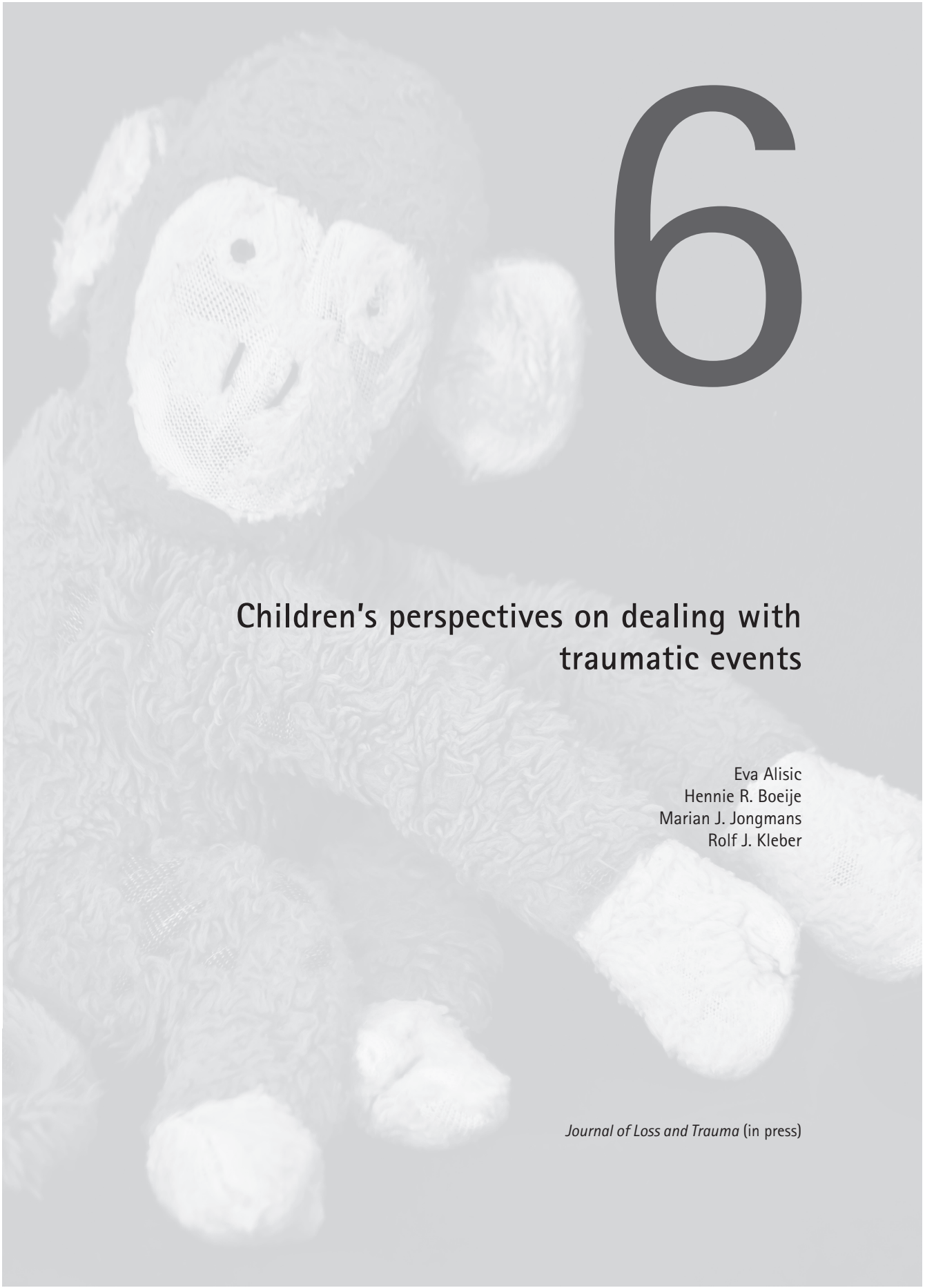

6

Children's perspectives on dealing with traumatic events

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ABSTRACT

Understanding children's recovery after trauma is considered important but existing theories are mainly based on adult research. We carried out semi-structured interviews with 25 purposively sampled children (8-12 years old) exposed to single-incident trauma. The children had been affected by the event itself but also by a long aftermath with secondary stressors. Most children had recovered gradually, were impressed by and benefited from the social support they received, and displayed a wide range of coping behaviors (categorized under concentrating on the normal and the positive; avoiding risks and reminders; actively working through trauma; seeking support). Current theories need child-focused adjustments.

INTRODUCTION

Children who are exposed to trauma, such as a serious road traffic accident, a house fire, the sudden life-threatening condition or death of a family member, natural or manmade disaster, and individual or mass violence, are helped by various child serving agencies. These include health, mental health, education, child welfare, first responder, and criminal justice systems.[1] Children's functioning and well-being after exposure depend on these professionals' understanding of traumatic stress.[2,3] 'Trauma-informed care' can change the way in which children respond to and cope with emotional reactions to trauma and improve general outcomes, both physically and psychosocially. However, there is a lack of knowledge regarding how children deal with traumatic events.

At least 14% of all children[4] – more than 65% in some population samples[5] – are exposed to trauma in peacetime. Although most children recover after displaying initial stress symptoms, a significant minority suffers from long-term psychological problems. Estimations are that 36% of the children who have been exposed to trauma, develop Posttraumatic Stress Disorder (PTSD[6,7]). PTSD is characterized by symptoms of intrusion (e.g., recurrent distressing memories, nightmares), avoidance and numbing (e.g., avoiding conversations about the experience, losing interest in former hobbies), and hyperarousal (e.g., irritability, concentration difficulties). The disorder can impair children's development in emotional, social, academic, as well as physical domains.[8,9]

Several theories have been formulated to understand psychosocial recovery from traumatic exposure. For example, Horowitz[10] modeled the process of working through trauma as starting with an 'outcry' at the realization of the trauma, followed by a need for integration of the experience in a person's cognitive schemas until 'completion' occurs. At the heart of the process of integration is an oscillation between intrusive repetitions (e.g., recurring memories of the event) and numbness, repression, and denial. Regarding cognitive schemas, Janoff-Bulman[11] suggested that people unconsciously maintain an 'illusion of invulnerability' until they are confronted with trauma. The event is thought to shatter one's fundamental assumptions that the world is benevolent and meaningful, and that the self is worthy. The author described cognitive strategies that survivors use to rebuild their inner world, such as comparing oneself with less fortunate others. A further example of theory involves coping. According to Lazarus and Folkman,[12] two major ways of handling stressful experiences exist. The first is focused on changing the troubled person-environment relationship (active, problem-focused coping) whereas the second concentrates on changing the emotions that are implied (passive, emotion-focused coping). A final example concerns a model of benefit-finding or posttraumatic growth. Tedeschi, Park, and Calhoun[13] described the experience of positive change as a result of the struggle with highly challenging life crises. They proposed three domains in which this positive change occurs: perception of self (e.g., feeling stronger), interpersonal

relationships (e.g., becoming closer to relatives and friends), and philosophy of life (e.g., changing priorities).

These theories are, however, predominantly based on research in adults, whereas it is thought that children undergo qualitatively different recovery processes.[14] For example, children's cognitive and emotional skills, such as appraising situations and regulating emotions, are still developing. They might appraise threatening situations in a different way because their frame of reference is less clearly defined. In addition, they have not yet fully acquired the ability to reflect on and verbalize complex emotions, which can influence their way of working through trauma and experiencing change (see Salmon & Bryant[14] for an overview). Although considered important, the applicability and usefulness of the above-mentioned theories with regard to children have only started to be tested.[15-18]

A qualitative, child-centered approach is needed to advance the understanding of how a child experiences recovery after trauma. Children's experiences involve complex and dynamic processes (e.g., interactions with significant others and changes in these interactions over time). To build up a broad understanding 'beyond measures and numbers', we need to complement quantitative research with qualitative research.[19] In addition, it is increasingly recognized that children should be given a voice in (mental) health issues.[20] Because questionnaires and structured interviews give children limited means to convey their experience, exploratory, qualitative studies are both necessary and desirable. So far, qualitative, child-centered studies on recovery from trauma have been thin on the ground and very specific. They tended to focus on one type of event (e.g., anticipated death of a parent[21]) or one type of outcome (e.g., posttraumatic growth[18]), or were restricted by very small samples (e.g., six children[22]). Such confined circumstances preclude the generalization of findings. We aimed to advance theory building and trauma-informed care. We conducted semi-structured interviews to find out how the recovery process was experienced by children who had faced traumatic events of various natures and which factors they identified as helping or hindering.

METHOD

Participants

Study participants were recruited from the University Medical Center Utrecht (Utrecht, the Netherlands). Children registered as having experienced a single-incident trauma were eligible for the study, provided they were aged between eight and twelve, they did not or no longer receive mental health care, and the event had occurred at least six months previously. We focused on children in the last four years of elementary school to ensure that they were all in the same developmental stage and able to verbalize emotions and thoughts.[14] The traumatic events fitted the A1 exposure criterion for PTSD in the DSM-IV.[6]

We defined single-incident trauma as an acute event that did not occur in the context of chronic abuse, chronic maltreatment, or war (cf. Terr[23]). The children were not or no longer receiving mental health care. We recruited families by letter and then called them to answer any questions. Written informed consent and verbal assent were obtained from the parents and the children respectively. Inclusion in the study was continuous and carried out according to purposive sampling to achieve a maximum range in demographic characteristics, types of trauma, time since trauma, and degree of mental health care. We ended including children when theoretical saturation had been reached, i.e., when no significant new themes were emerging. The Medical Ethics Committee of the University Medical Center Utrecht approved the study protocol.

We approached the parents of 34 children for the study. The parents of seven children declined for various reasons including lack of time and concerns about exposing the child to the interview. In the case of two children we were unable to contact both divorced parents for informed consent. Participation was not significantly related to age, gender or type of trauma ($p > 0.10$; other variables unknown for nonparticipants). Twenty-five children (15 boys and 10 girls, mean age 10.7 years) participated. Their experiences were categorized under sudden loss, violence, and accidents with injury (see Table 6.1). The time since the event ranged between ten months and seven years, with a median of 27 months. Use of mental health services varied from zero to more than eleven sessions (e.g., psycho-education, cognitive behavioral therapy) with a mode of two to five sessions.

Interviews

The topics in the interview guide (see Table 6.2) related to the characteristics of the trauma, immediate reactions, reactions over time, changes in outlook on the world, the self or others, milestones, and factors that assisted or impeded recovery. The wording of the questions was as open as possible to cover the topics of interest. The interviews were carried out by an experienced, trained interviewer (EA) after the topic guide had been critically examined in role-play with a clinical psychologist specialized in pediatric trauma care. HB monitored the wording and openness of the questions in the interviews based on the transcripts. Questions were continuously adapted to themes that emerged during the study on the basis of research team decisions. For example, we initially asked about exact timing and order of events or changes (e.g., How long ago did you … ?) which turned out too difficult for the children to answer reliably (e.g., they said they did not know, or they gave answers that did not match information we had about an event). Therefore, we deleted these questions from the interview guide.

Because the interviewer was unknown to the children and the topic was sensitive, several measures were taken to make the child feel at ease and in control, including play at the beginning of the interview and a stop sign (a copy of the traffic sign) that the child could

Table 6.1 Primary traumatic events children were confronted with

Sudden loss (*N* = 6)
Loss of brother due to drowning
Loss of sister due to explosion at home
Loss of father due to suicide
Loss of sister due to train accident
Loss of favorite school teacher who died after a cardiac arrest
Loss of mother and absence of father because father killed mother
Violence (*N* = 8)
Witness to suicide
Witness to beating of father
Witness to murder
Witness to suicide attempt
Burglary
Physical assault by another child
Sexual assault by unknown adolescent boy
Sexual assault by unknown man
Accidents with injury (*N* = 11)
Cart accident resulting in a liver laceration
Bike accident resulting in a complicated jaw fracture
Car accident resulting in multiple injuries
Fall from tree resulting in a basal skull fracture
Bike accident resulting in a gastric perforation
Car accident resulting in a crushed elbow
Bike accident resulting in a liver laceration
Fall in swimming pool resulting in a complicated femur fracture
Hit by a car, resulting in a complicated femur fracture
Fall from high bed, resulting in a ruptured spleen
Hit by a truck, resulting in a complicated tibia fracture

use to terminate the interview verbally or nonverbally at any time. One child was shortly in tears during the interview but said that she wanted to continue the interview. None of the children used the sign or any other means to terminate the interview prematurely. The interviews (excluding play, introduction, and ending) lasted 30 minutes on average (ranging from 21 to 60 minutes, audiotaped). Afterwards, the children received a small surprise gift. Additional mental health care was offered after the interview and was accepted by one family.

Analysis

Interviews were transcribed verbatim, except for names, dates, and locations, which were substituted with functional codes to ensure confidentiality. Analysis was done on the Dutch data. Selected quotes for this article were translated into English by an official

Table 6.2 Interview guide

The event
Characteristics of the event
(e.g., what happened, where, who were there, what did they do?)
Emotions and thoughts of the child during the event
(e.g., what did you feel, which feeling was strongest, which thoughts came into your head?)
The worst aspect of the event / what upset the child most
(e.g., what was the worst part of the event, what upset you most?)
Shattered assumptions
(give example of a changed assumption about e.g., the safety of riding a bike, followed by questions (for younger children) about whether the child recognizes this, or (for older children) whether the event changed his/her ideas about the world/life; the example given should be different from the type of event the child was confronted with)
Immediate reactions
Child's emotions, behavior and cognitions
(e.g., how did you feel, what did you do, what did you think of, what was your daily program?)
Reactions of others
(e.g., how did your family react, what did you think of that, what did your friends do?)
Changes in reactions
Presence of the event in daily life
(e.g., did you think about it, when, where, how did you feel then, what did you do to feel better, were there moments that you did not think of it?)
Emotions
(e.g., how did you feel most of the time, which emotion was strongest, did it change, how, when?)
Intrusion and avoidance
(example of how children sometimes want to talk about the event, and sometimes do not, followed by what was it like for you?)
Milestones
(e.g., where there any special moments in the period after the event, could you describe them, did it change anything in how you felt/thought about the event?)
Positive experiences
Posttraumatic growth
(e.g., is there a positive side in the story for you, what did you learn from the event, how did it change things for you in a positive way?)
Influences on dealing with trauma
Risk factors
(e.g., what/who made it difficult for you to deal with the experience, what made you feel bad, how, when?)
Protective factors
(e.g., what/who helped you to deal with the experience, what made you feel better, how, when?)
Behavior
(e.g., what did you do to feel better, what advice would you give to another child who has had a similar experience, what would you do if a friend of yours had a similar experience?)
Other information
Other relevant information
(e.g., what else do you think is important for me to know?)

translator. The data were imported in MAXQDA 2007.[24] Our approach was inductive (based on grounded theory[25]), although the publications mentioned in the introduction were prior knowledge. Each potentially meaningful fragment in the first four transcripts was coded independently by EA and HB and the differences were discussed until consensus was reached. Subsequent interviews were initially coded by EA and checked by HB. MJ and RK reviewed the codes to avoid potential researcher bias. In line with the 'constant comparison' method[26] new interviews were compared with existing codes to identify similarities and differences. The codes were grouped into conceptual categories and the interrelationships were continuously discussed by the research team. Theoretical saturation was suspected after 20 interviews and then confirmed with five subsequent interviews.

RESULTS

Four interrelated themes emerged from the children's narratives. They talked at length about the long aftermath of the trauma (I). Nevertheless, the majority said that they slowly but surely felt better and often identified positive aspects within the negative experience (II). The importance of support stood out in these stories (III); they felt supported by people and cuddly toys, although they also experienced some downsides. Finally, they felt that their own behavior had played an important role: they had developed a variety of ways to deal, or cope, with the trauma (IV). These themes are presented below.

Long-lasting consequences

Though the children had faced a single-incident trauma, they talked a lot about the serious, long-lasting consequences. The injured children needed long periods of physical recovery during which they were unable to take care of themselves as before. The medical procedures brought additional frightening moments, both in themselves and through confrontation with other injured children. For example, one child recalled:

> *"And I had to go to the doctor's every afternoon. That wasn't much fun … right there, in front of you or behind you, would be a couple of kids that looked really horrendous. One boy had his whole head in bandages, because he had a gash in his head. They all had to go there as well, so you were standing there among kids from unbelievably serious accidents."*

The children who had experienced loss also felt a long-lasting and omnipresent impact. They missed their caregiver or sibling not only as part of the family but also as a partner in play, and they were confronted with the enduring grief of other family members. The children who were exposed to violence also reported a long aftermath (e.g., having to testify multiple times after sexual assault).

The children talked more about the long-lasting consequences of the event than the event itself. Many had difficulty recalling how they felt and what they did exactly during or directly after the event. Some remembered being frightened. The memories of the children who had sustained injury related primarily to physical pain, sometimes combined with fear, whereas the memories of the children who had experienced bereavement related primarily to immediate feelings of sadness. A few recalled being disorganized or feeling 'strange'. Several mentioned that they felt odd at not knowing exactly what had happened. They had been trying to fill in the picture by, for example, putting questions over and over again to people who were present at the event.

Virtually all the children talked about being distressed after the event. Nightmares and feeling upset, sad, or scared when reminded of the event figured most prominently in their narratives. Several children talked in detail about reminders. These triggers of distress could be very specific. A boy whose worst moment during the event was seeing a body covered by a white sheet became distressed every time he saw similar scenes on the news, but he still loved to watch horror movies and crime series. Many children suffered from nightmares, which varied from being seemingly unrelated to the event, such as dreams about monsters, to clearly related, as in the case of a boy who lost part of a finger in an incident of violence:

> *"Then the nightmares started… Once I was sitting in a train and there was a skeleton behind me who wanted to chop off my arm. Or I was at my gran's and every time I bumped my arm or my leg or my head it fell off."*

For many children the world had become a less secure place. Some explicitly stated that their view of the world had been threatened by the event:

> *"[What is different from what I previously thought] is that water is a bit scary, that you can easily drown. I had heard about it but I had never thought you could die so quickly and that it would happen to my brother."*

Other children exhibited this change more indirectly by describing their behavior:

> *"I am more careful now… Because people you know well… you can believe them, only you really shouldn't believe people you don't know, you should ask first."*

Although many children mentioned a long-term physical and/or psychological impact, all but one felt they had recovered.

Feeling better a step at a time

All the participants but one felt that things had improved since the event. They were actually doing well again. Many children merely said that they "felt better". Others elaborated and implicitly or explicitly compared their current feelings with earlier moments:

> *"I can think about it now without feeling sad, getting tears in my eyes, or getting scared."*
>
> *"I was scared of red, it was the blood… My finger had been bleeding like crazy… Now it's my favorite color."*

The children found it difficult to explain the exact nature of the change; most described it as getting better a step at a time or feeling a little better every day. Occasionally, a child went into more detail. A girl who had been raped said she had started sleeping with the light on and the bedroom door open. She described how she had gradually dimmed the light and closed the door until the light was off and the door was completely shut.

Not only did the children speak of a gradual process of coming to terms with the trauma, about twenty, when asked, said there had been no milestones or big leaps along the way, further confirming their own vision of a step-by-step recovery. A few children did mention life events, such as moving to another village, changing schools, or the death of a grandparent.

Only one child remarked that his feelings had not changed since the event. He had lost his sister relatively recently compared with the other children. He also said that the whole family was still grieving. His parents visited his sister's grave almost every day and his parents and siblings wept now and then. He did, however, touch on some positive developments, saying that he felt supported by his friends and that he sometimes recalled humorous moments with his sister.

Many children identified positive elements within the negative experience of the traumatic event. For some, these consisted of privileges, such as not having to eat everything in the hospital or enjoying more 'computer time' than at home. One of them loved the fast ride in the ambulance with wailing sirens and having fun in the hospital. Positive changes had also occurred to a more substantial degree in a few children. One boy said that former bullies had been kind since the event and a girl who had lost her mother could empathize more with children in similar situations. Other children felt lucky to have survived an accident or to have been treated by a specialist surgeon.

Receiving support

The children talked spontaneously and profusely about the support they had received. They described the mounds of postcards, drawings, gifts, visits and other tokens of sympathy and friendship received from anybody and everybody from close friends to

former 'enemies', classmates, family members, teachers, (mental) health care workers and authorities. Peers and family members figured most in the narratives: they expressed sympathy and offered practical help. The support bolstered the children's spirits; they felt that the people around them cared:

> *"And cards of course… I got lots and lots… And drawings from the children in my class… I had these drawings hanging in my room for a long time. That was funny, made me feel good. That these kids – yes, your friends – are thinking about you."*

A few children placed less emphasis on attention – a response that appears to be linked to the type of event. Whereas accidents and losses lent themselves to people being supportive, violence and suicide incidents appeared to be a different matter. Because these were not always followed by absence from school, classmates might not have fully grasped the seriousness of the event and teachers might not have had a chance to organize a collective class present. But, these events did invite sensation-seeking. For example, a boy who had witnessed a suicide said:

> *"They were all telling stories at school about how they had seen a flowerpot fall on her head, that sort of stuff and then that she fell from a flat, but she simply jumped, and all sorts of other stories."*

One special type of support that seemed unrelated to the type of event came from cuddly toys. Many children referred spontaneously to their help. Cuddly toys helped them to sleep, feel better, laugh and stick up for themselves. They were an ally who made them feel comfortable and who they could 'send' their negative thoughts to. One boy said he felt his cuddly toys had magical power to shield him from harm. Children who had been given a bear in the ambulance gave it a special place in their bedrooms. Several children mentioned cuddly toys when asked what advice they would give to other children in similar circumstances. For example, one child said:

> *"In any case something to… a cuddly toy, that… that comforts you, if I can say so. That helps… When I see mine and I cuddle it, it always made me laugh."*

Coping styles

The children showed a wide variety of ways in which they coped with the traumatic experience. These ranged between conscious strategies and relatively oblivious behaviors, and revolved around four interrelated categories (see Table 6.3):

(a) Concentrating on the normal and the positive. Many children explained that they tried to feel better by engaging in play and 'fun activities'. This helped because it was entertaining and took their mind off things. Efforts to 'get on with life as usual' were

Table 6.3 Ways of coping

Concentrating on the normal and the positive
Playing / doing 'fun things'
Getting on with normal life
Thinking positive thoughts
Enjoying 'trauma gains'
Joking about the event
Avoiding risks and reminders
Taking more care with activities
Taking more care when meeting strangers
Training oneself in fighting techniques
Avoiding places that remind one of the event
Choosing carefully who to tell about the event; avoiding sensation seeking
Asking friends/classmates not to talk about the event
Working through the trauma
Trying to find out what happened
Attributing causes of the event externally
Talking about what happened
Commemorating the event / the lost loved one
Expressing feelings through poems, drawings
Seeking gradual exposure to activities/places that have become scary
Seeking psychological care
Seeking out bystanders present at the event
Seeking support
Seeking hugs, comfort from parents/siblings
Seeking comfort/support from cuddly toys
Telling friends/classmates what happened
Commemorating received social support

also mentioned regularly. The children tried to pick up normal routines and pastimes. For example, one girl who had suffered a severe arm injury returned to horse-riding as soon as possible after the accident.

(b) Avoiding risks and reminders. About three out of four children tried not to be reminded of the event or made an effort to avoid risks. One girl who had had a cycling accident avoided riding down slopes on her bike in order not to fall again. She chose alternative routes to her friends, even when it took her a lot longer than the direct road. Other children tried to avoid uncomfortable questions about what had happened by being selective in their choice of discussion partners or by asking friends not to talk about the event. One child had the following tactics to avoid reminders:

> *"Sometimes [my parents] talk about the accident. Most of the time I just say something else so I don't need to talk about it with them. I don't want to talk about it. Then I just start chatting with my sister... Sometimes they say something and I just nod regularly so they don't notice [that I'm not listening]."*

(c) Working through the trauma. The children used a variety of ways to actively work through the trauma. They looked for an explanation for what had happened and seemed to be trying to keep a positive self-image intact by suggesting that the blame lay elsewhere or that it was down to providence. For example, a child attributed the event to being in the wrong place at the wrong time:

> *"It was awful but it could have happened to anybody... he could have called anybody, and then someone else would have been raped. It might have happened to a friend... It was just bad luck that it was me."*

Some children worked through the trauma by engaging in commemorative acts: they set up little shrines at home for the deceased or they stored items that were linked to their injury, such as the iron pin used to set the fracture or the sling. Several said that it helped to talk with their parents, friends or therapist about what happened.

(d) Seeking support. Regardless of the content of the exchange with others, many children sought feelings of support. They explained, for example, that they had asked for more hugs from their parents. Several recalled the large – and exact – number of cards they had pasted in a special book or the drawings by friends that hung in their bedroom. Looking at these cards and drawings made them feel good. Some children brought them along to the interview. As mentioned earlier, several sought comfort from cuddly toys. Again, some brought them along to the interviews.

Virtually all the children mentioned or displayed more than one way of coping. For example, a boy who had survived a car accident said that he joked about the accident, tried to think positively, and had continued as normal. He also clarified that certain circumstances caused the accident, an external attribution. He showed behavior that fell into two of the categories of coping styles but the majority of the children referred to behaviors that fell into three or all of the categories. For example, a girl who was confronted with a burglary had joined a kickboxing club to learn self-defense, had focused on doing 'nice things' and had talked with other people about what had happened. The child who did not yet feel better mentioned relatively few coping strategies; he mainly explained that he commemorated his sister regularly.

DISCUSSION

Twenty-five children between the ages of eight and twelve described their experience of single-incident trauma and how they came to terms with it. The overall picture showed that the children had been affected not only by the traumatic event itself but also by a long aftermath. In general the children had recovered step-by-step, were impressed by and benefited from the social support they have received, and displayed a wide range of behaviors to cope with what had happened.

Strengths and limitations

Before we discuss the implications of the findings, the strengths and limitations of this study should be noted. One of its merits lies in the fact that we asked children themselves about their experience and invited them to raise issues that matter to them.[20] The variation in the sample also enabled us to identify commonalities across different types of single-incident trauma, backgrounds, and paths to recovery which is rare in both quantitative and qualitative research. In addition, the data were continuously analyzed and discussed within a team of researchers, thereby circumventing the subjectivity issues sometimes associated with qualitative research carried out by single researchers.[27]

The study has clear limitations. First, this study has been conducted in a country with a Western culture, by researchers with a Western background. Children in the Netherlands may learn to cope with and communicate about trauma in a specific (e.g., individualistic) way. The influence of culture on children's reactions to trauma has been reported for certain types of experiences (i.e., war,[28] parental cancer[29]). In addition, we may have asked questions and interpreted narratives in our own Western, Dutch way. Therefore, the findings should not be generalized to other cultures. Second, the participants came from one hospital, a national center that serves a mixed population. We could not estimate the impact of differences in services in other, often smaller hospitals. For example, it is possible that children in other settings had different types of encounters with (mental) health care professionals. Third, although this study reveals aspects of dealing with trauma that are important to children, the magnitude of the effects will have to be confirmed in experimental research designs: our approach was exploratory. Fourth, the children reported on their experiences in retrospect. It is possible that their memories were influenced by their current well-being and that they would have brought up other themes when they were 'caught in the moment'. Also, children found it difficult to reflect upon issues of timing and the nature of changes. It would be valuable to test our findings in a study starting shortly after exposure (provided the children feel 'in control' in the research). Fifth, we studied a sample of children exposed to single-incident trauma. Even though this represents a large and sometimes under-recognized group of children confronted with adversity,[30] our findings should not be generalized to children who have been traumatized chronically.

Implications of the findings

The long aftermath of the trauma, including secondary stressors, such as medical procedures and parental stress reactions, was an important theme for the children. Secondary stressors have already been acknowledged as a risk factor for prolonged posttrauma distress.[31] Although there have been several indications that subjective appraisals are often stronger predictors of stress reactions to primary stressors (the traumatic events) than objective exposure criteria,[15,32] secondary stressors are generally measured from an objective or external perspective only. Researchers measured, for example, the number of invasive procedures or parental symptomatology.[33] The results of the present study show that children's subjective appraisal of secondary stressors should be taken into account.

The finding that the predominant psychological symptoms were trauma-specific fears, intrusive thoughts and nightmares is in line with earlier research.[17,23] In adult models such intrusive symptoms are often seen as the antipole of avoidant reactions: trauma survivors are thought to oscillate between the two until finding a new equilibrium.[10] However, although many children showed elements of both, they primarily described a step-by-step recovery without big leaps. We therefore suspect oscillations to be unconscious or relatively subtle phenomena in children.

Our findings suggest that the theory of shattered assumptions[11] needs some adjustment with regard to children exposed to single-incident trauma. The children's outlook on the world had changed, which is in line with the theory but, in contrast, their self-image was still intact. Many searched for explanations as to why the incident had happened in the first place and why it had happened to them. The answers they came up with attributed possible responsibility for the incident to an external source, which is more in line with the notion of 'minimal learning'.[34] This notion implies that when children attempt to cope with trauma they try to keep their basic assumptions or schemata intact. They might build adaptive illusions and apportion blame because it is easier to attribute a particular meaning to an event than to change a deeply entrenched system of personal beliefs: core assumptions about oneself (e.g., 'I am strong and worthy') will be protected more vigorously than marginal assumptions (e.g., 'Strangers are benevolent'). In our view, further insights could be gained by exploring the effects and boundaries of minimal learning in children and ways of stimulating minimal learning without losing contact with reality.

Whereas minimal learning relates to resistance to negative change, posttraumatic growth theory relates to the experience of beneficial change[13,16] in the form of, for example, a greater sense of personal strength or connectedness with other people. In our sample, we found only a few indications of explicit personal growth as outlined in the theory (e.g., feeling more empathy) but many children identified 'smaller' positive elements within the negative experience (e.g., having had fun). It has been suggested that the experience of

posttraumatic growth requires a well developed ability for abstract reasoning and self-awareness. Our findings converge with those of Salter and Stallard[18] who, in a sample with a wide age range, reported that posttraumatic growth occurred mainly among the adolescents and not the younger participants. In contrast to fundamental changes for the positive, the smaller positive elements within the negative experience appeared in many narratives in the current study. The possibilities of fostering positive experiences in children exposed to trauma[35] should be further studied to inform intervention development.

Support proved very valuable to the children, particularly the support from peers, family members, and cuddly animals. Although peers play an important role in middle childhood,[36] studies on peer support for traumatized children are rare.[37] Our findings suggest that peer support might be a mediator between trauma and recovery, with some types of trauma (e.g., injury) being more amenable than others (e.g., violence). Our findings also confirm the important role played by the response of family members.[2,14,38] The role of the family in posttrauma recovery in children has been largely conceptualized as parental symptomatology. In our view it will be important to include family functioning, parental modeling of coping, and facilitating the regulation of emotion in children more often.[14,39] It would be helpful to know more about the way parents promote (or push) certain coping styles in their children. Cuddly toys, finally, appeared with surprising frequency as sources of comfort. Several theories have been developed about children's attachment to transitional objects and imaginary companions.[40,41] An explanation of the importance of cuddly toys after severe stressors may be their capacity to provide support when parents or significant others are not available. Our findings suggest that the growing practice of giving a child a cuddly toy during emergency situations is beneficial.

Coping figured far more strongly in the children's narratives than in the empirical literature on child trauma. Our findings do not confirm the two-factor framework described by Lazarus and Folkman[12] but point to a multifactor model. Our categorization comes close to results from a factor analytic study in a general (i.e., not trauma-focused) sample of children.[42] It revealed the factors distraction ('concentrating on the normal and the positive' in our categorization), avoidance ('avoiding risks and reminders'), active coping ('working through trauma'), and social support ('seeking social support'). It will be necessary to replicate our multifactor model in future studies with children exposed to trauma.

We found a wide range of coping behaviors in a sample of children who virtually all felt they were doing well again. Each way of dealing with trauma might have its own function in helping a child to come to terms with it. Given that the one child who did not feel that he was recovering showed only a few coping behaviors, one could surmise that having a whole repertoire of coping behaviors would be helpful. However, the only study carried out on this topic found that children with PTSD at eight months after trauma had reported more coping strategies at six weeks than children without PTSD at eight months,[43] suggesting a

relationship in the opposite direction. Further research is necessary. We propose further testing of the hypothesis that children with a larger repertoire of coping behaviors will show a better recovery to better understand these processes.

Even though an overall picture emerged, we encountered many variations in the specific stories, distress symptoms, and coping efforts of the children. The children's degree of elaboration in the interviews on what happened, the emotions they had felt, and the degree of reflexivity on how they dealt with the trauma also varied considerably. Though researchers generally aim to discern the main lines of behavior and attitudes, these individual differences should still be recognized.

Based on the above, more research is needed on means to support children in their struggle with shattered assumptions, ways of fostering positive experiences, the role of friends and family members, and (the effectiveness of) different posttrauma coping styles. This will enable testing and elaborating on our preliminary proposals to adjust current adult trauma theories. The study findings also have preliminary practical implications for working with children in prevention or treatment contexts after trauma. Although they may seem 'intuitive', they deserve more explicit attention. First, the impact of secondary stressors should not be underestimated and subjective appraisals of these stressors should be taken into account in clinical assessments. Second, as social support turned out to be very important to the children, facilitating support needs to become a more extensive standard element of prevention or intervention programs. Tuning in to the child's world in this respect might involve cuddly toys and tangible signs of support from friends. Currently, most literature about interventions directly after trauma argues against debriefing, as this has been shown to have no or even detrimental effect in adults,[44] but little is written about other direct interventions, such as to enhance social support. Third, children show a wide variety of coping styles. Because there is not one best style identified yet; individual coping styles need to be acknowledged and assessed, they can form helpful starting points in conversations with children exposed to trauma.

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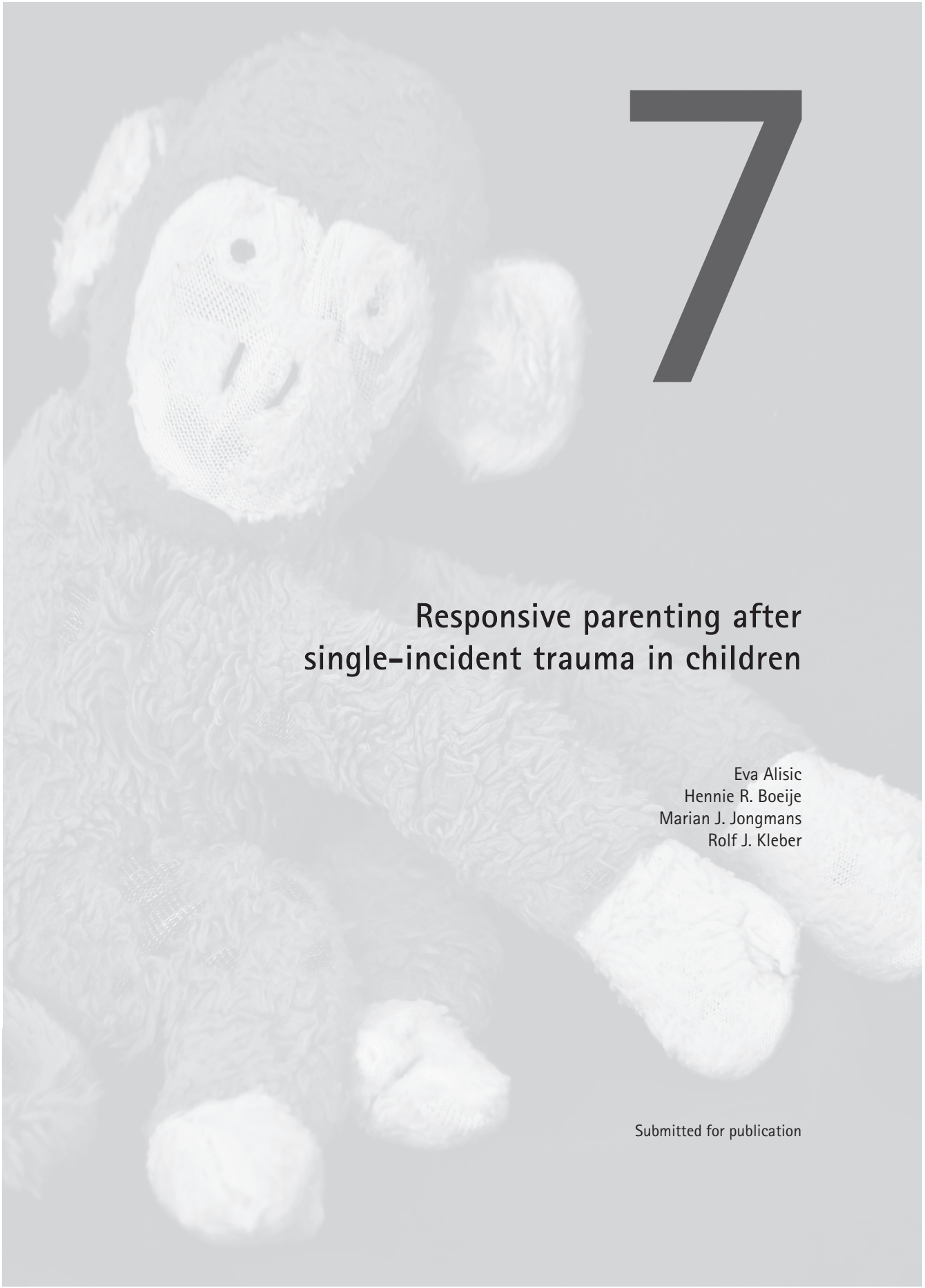

7

Responsive parenting after single-incident trauma in children

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ABSTRACT

Objective: Although it is known that parents' distress after traumatic events in children influences children's posttraumatic stress, little is known about parental practices to support children after trauma. In order to improve trauma-informed health care we explored these practices.

Design: Qualitative design with semi-structured interviews. Data collection and analysis according to the 'constant comparison' method were carried out until no new themes emerged.

Setting: University hospital in the Netherlands with tertiary referral function.

Participants: Parents (*N* = 33) of 25 children aged 8 to 12 years registered as exposed to single-incident trauma (e.g., violence, accidents, sudden loss) at least 6 months previously and not or no longer using mental health care.

Intervention(s)/main exposure(s): None.

Outcome measures: Themes emerging from the interviews.

Results: Parental responsivity after trauma, consisted of a) being aware of a child's needs and b) acting upon these needs. Fourteen strategies, such as comparing behavior with siblings' behavior and providing opportunities to talk, were identified. Central to responsivity after children's traumatic exposure were parents' attempts to follow their children's pace of recovery while providing structure and guidance, or seeking help to do this. Parents felt that their capacity to be responsive was influenced by their own level of distress.

Conclusions: A theoretical framework for future research and conversations with parents is proposed. Trauma informed care would benefit from recognizing parents' challenge to support their child after traumatic exposure and from aligning more with parents about procedures that may cause the child to be reminded of the event.

INTRODUCTION

Pediatric health care professionals see many children who have been exposed to traumatic events and serve crucial roles in helping these youngsters.[1,2] Traumatic events are characterized by an overwhelming confrontation with death, serious injury, or other threat to physical integrity.[3] Examples include natural disasters, serious accidents, violence, and the sudden loss of a loved one. Exposure to these events is fairly common in children, with prevalence rates ranging from 14%[4] to over 65%[5,6] in peacetime general population studies. Traumatic exposure puts both mental and physical health at risk in children.[2,7-9] For example, they may develop posttraumatic stress disorder (PTSD[3]), encounter problems in academic functioning, and show increased rates of various physical disorders.

The care of pediatric providers is essential for children confronted with severe stressors. These professionals are trusted adults to whom children can disclose experiences, who can screen for functional impairments caused by an experience, who can provide education about normal reactions to trauma, and who can monitor whether exposed children show psychiatric symptoms.[2] In addition, they can encourage parents to seek specialized mental health care for their child and promote parents' optimal assistance to their child.[2,10] Parents influence children's recovery.[11-13] Particularly, parental distress is a significant predictor of posttraumatic stress reactions in children.[14-16] In their model of 'Relational PTSD', Scheeringa and Zeanah describe three parenting styles that exacerbate the symptoms of very young children: the withdrawn parent, the overprotective parent, and the frightening parent.[17]

However, the current knowledge base is rather small[12,13] and has several limitations. First, the available studies focus on the negative influence of parents on children which leads to PTSD. Very little is known about parental strategies to support children after trauma. Although research in other domains regards positive parental behavior such as sensitivity and responsiveness,[18] this is unusual in the field of child traumatic stress. Second, most research is looking at correlations between symptom scores, which provides broad insights about associations. However, in order to assist parents in helping their children recover, it is necessary to delineate parental behaviors and parent-child interactions related to trauma. Third, existent research on parental behaviors concentrates on very young children, whereas parents are important for children in school age as well.[11] Finally, studies on single-incident trauma (as opposed to chronic trauma) are especially rare, although psychological consequences can be very important.[19]

The purpose of the current study is to explore parents' experience of helping their children after single-incident trauma in order to improve 'trauma-informed' health care,[20] with a focus on children who have successfully recovered mentally. Since qualitative methods enable the exploration of complex and dynamic processes and we wanted to study

commonalities across different types of experiences, we conducted semi-structured interviews with parents of children who had been confronted with a wide range of traumatic events.

METHOD

Participants

Primary caregivers (referred to as parents) were recruited as part of a study on children's recovery after traumatic exposure. The findings regarding children's experiences are reported elsewhere.[21] Children registered at the University Medical Center Utrecht, the Netherlands, as having experienced a single-incident trauma were eligible, provided they were aged between eight and twelve, they were not or no longer receiving mental health care, and the event had occurred at least six months previously. The traumatic events fitted the A1 exposure criterion for PTSD in the DSM-IV.[3] Written informed consent and verbal assent were obtained from the parents and the children respectively. Inclusion in the study was continuous and carried out according to purposive sampling to achieve maximum diversity in demographic characteristics, types of trauma, time since trauma, and degree of mental health care. We stopped including families when no significant new themes emerged from the interviews. The study protocol was approved by the Medical Ethics Committee of the University Medical Center Utrecht.

The parents of 34 children were approached for the study. The parents of seven children declined for various reasons including lack of time and concerns about exposing the child to the interview. In the case of two children we were unable to contact both divorced parents for informed consent. Participation of families was not significantly related to child age, child gender or type of event ($p > 0.10$; other variables unknown for non-participants). Twenty-five families participated, with 33 parents involved in the interviews (see Table 7.1). The experiences of the children (15 boys and 10 girls, mean age 10.7 years) were categorized under sudden loss (six children, e.g., losing a sibling due to drowning), violence (eight children, e.g., sexual assault, witnessing severe beating of a parent), and accidents with injury (eleven children, e.g., sustaining complex fractures in a road traffic accident).

Interviews

The topics in the interview guide (available from EA) related to the characteristics of the trauma, reactions of the child, changes in the child's outlook on the world, factors that assisted or impeded the child's recovery, and parents' role in the child's recovery. We focus on the latter in the remainder of this paper. The wording of the questions was as open as possible. An experienced, trained interviewer (EA) carried out the interviews while HB continually monitored the wording and openness of the questions based on the

Table 7.1 Parent, child, trauma, and care characteristics

Characteristic	*M* / *N*	*SD* / %
Demographics		
Age of interviewed parents (*N* = 33)	41.4	5.8
Number of interviewed fathers	9	27%
Age of children in the study (*N* = 25)	10.7	1.04
Number of boys	15	60%
Family situation:		
Child lives with both parents	18	72%
Child lives with single parent	3	12%
Child lives with parent & stepparent	3	12%
Child lives with foster parents	1	4%
Number of children in a family	2.4	0.87
Trauma and care characteristics		
Time since the event (in years)	2.8	1.74
Children admitted to hospital	12	48%
If hospitalized, number of days	15.7	28.65
Number of mental health care sessions for child/parents*:	15.7	
0 sessions	1 / 4	4% / 16%
1 session	4 / 3	16% / 12%
2-5 sessions	14 / 10	56% / 40%
6-10 sessions	5 / 5	20% / 20%
≥ 11 sessions	1 / 3	4% / 12%

***** Mental health care sessions within the Psychotrauma Center for Children and Youth. In two-parent families, parents are seen together during sessions.

transcripts. The body of the interviews lasted 37 minutes on average (ranging from 15 to 72 minutes, audio taped). Additional mental health care was offered after the interview and was accepted by one family.

Analysis

Interviews were transcribed verbatim except for names, dates, and locations, which were substituted with functional codes to ensure confidentiality. The data were imported in MAXQDA 2007.[22] The study's approach was inductive. Each potentially meaningful fragment in the first four transcripts was coded independently by EA and HB and the differences were discussed until consensus was reached. Subsequent interviews were initially coded by EA and checked by HB. MJ and RK reviewed the codes to avoid potential researcher bias. In line with the 'constant comparison' method[23] new interviews were compared with existing codes to identify similarities and differences. The codes were grouped into conceptual categories and the interrelationships were continuously discussed by the

research team. Categories became saturated with 22 interviews, which was confirmed with three subsequent interviews. A clinical child psychologist and a social worker, both independent to the study, reviewed the results.

RESULTS

Although the interviews covered a range of topics, parenting strategies to promote children's psychological recovery after traumatic exposure were prominent in participants' narratives. They often started to talk about these practices before any questions were posed about them. We distinguished two aspects in the narratives: being aware of a child's needs and acting upon these needs. We will refer to the combination as 'responsive parenting after trauma'. We elaborate on the two categories of practices in the following sections. Being responsive was a challenge for parents. One father mentioned both aspects of responsive parenting while expressing this challenge:

> *"But I wonder, does he really still think about it? I don't know. Yeah, anybody would want to know their kid so well that you know that 'it's done', or 'something is still bothering my child'. And if the latter is the case, that you take action."*

Being aware of a child's needs

Parents tried to get a sense of how their child was doing after the event. They made use of several strategies (see Table 7.2). One was to directly ask the child how he or she was doing. A second was to compare the child's behavior before and after the trauma. Another was to determine whether the behavior of children was in line with their character. For example, a mother told that her son was rather introvert and that his reluctance to talk about the event was rather in line with his character instead of a potential stress reaction she was worried about. A fourth way to find a point of reference for the seriousness of children's posttraumatic reactions was by comparing them with siblings:

> *"I have another son, who is younger by two years. Now he did cry a lot… (My oldest son) did not cry as much as the youngest but he shows his tears."*

Some parents mentioned that they tried to monitor the child's reactions but found it difficult to come to conclusions. In order not to miss possibly important cues, parents checked other people's impressions of the child, such as a mental health care professional or a school teacher:

> *"At school you talk about it a bit more with the teacher. And yeah, the teacher didn't really see that he ran behind or couldn't concentrate as well. No, it's going well at school."*

Parents did not always succeed in being aware of their child's needs and functioning. One mother had missed her child's signals that he was still suffering from stress reactions related to the violence the family had encountered. She thought that he was too young to be affected by the incident. She did have the feeling that something was not going well for the boy, but thought that his concentration problems at school had to do with dyslexia. Looking back, she felt that her child's malfunctioning had continued for years because she was unaware of his needs. Only after it was discovered that he suffered from posttraumatic stress an adequate intervention was provided and he recovered.

Acting upon the child's needs

Parents not only tried to be aware of their child's functioning and needs, they also took action to facilitate their child's recovery (see Table 7.2). Their approach often incorporated an element of making sure that the child felt in control. For example, when parents explained that it was important to talk about the event, most of them went into more depth and said that they actually provided an atmosphere in which the child felt free but not obliged to talk. Part of being able to provide such an atmosphere was knowing the child very well. Some parents pinpointed in which situations their child would talk about distressing thoughts or feelings and made sure they provided the opportunity:

> *"He hardly talks about it. He does talk about it with me when we're taking a bath. Then the two of us take our time and he won't stop talking."*

The children had many questions, for example about 'right and wrong' after incidents of violence and about what happened exactly in a car accident. With regard to answering questions parents again tried to adjust to the child's pace, by saying that the child was free to ask, and that when he or she was ready, parents would provide information. Some parents felt that their approach differed from the one followed by police officers or doctors:

> *"Sometimes doctors came barging in and they would start that whole conversation, whereas we were just easing her into it, like 'Whenever you're ready we'll tell you about it'."*

Being sensitive to their child's pace stood central as well in parents' descriptions of stimulating their children to do things that they preferred to avoid after the traumatic event, such as going to school by bike after a traffic accident or being confronted with a changed body image. The way parents guided this confrontation with reminders appeared to be a combination of challenging the child and giving the child control over the situation. Under these conditions, several children finally made the step towards the confrontation:

Table 7.2 Strategies used to parent responsively after trauma

A) Being aware of a child's needs

1. Asking a child about how it feels about the event
   "Then I thought, 'Gee, does he still think about it now and then?' But he sort of brushed it off, 'No mom, not at all anymore really', but then he did mention two examples 'If I fall really hard' and 'Once in a while...'. So I asked 'Does it still make you sad or anything?' 'No.' He said it doesn't."

2. Comparing behavior before – after trauma
   "But [my daughter] now has different problems at school, mostly social problems. Sometimes at home I've mentioned that I really wonder if those problems have something to do with the accident. After the accident, the fact that she has changed, you know, has become a little less happy."

3. Appraising reactions in the light of a child's character
   "Yeah, they are two really great and active boys, always playing outside. Yeah, that was all gone for a little while."

4. Comparing behavior with siblings' behavior
   "[My oldest daughter's first reaction was] calm. My other daughter got out of the car and went and stood between the barrier and the grass looking away from the car, she didn't want to see any of it. ...we had to wait in the ER and [my oldest daughter] sat there chatting happily with the nurse, telling her about her plans and where she went to school, and we kept looking at her and thinking, what on earth..."

5. Checking impression with other adults involved with the child
   "Before school started I went to them [the teachers] and told what had happened, so they knew what kind of child they would have in class. That has been a good thing... they also gave feedback, which we could use at home. We went to school for it ... I am happy I did that."

B) Acting upon the child's needs

1. Providing opportunities to talk
   "If they want to talk about it, you have to be there, but you can't be like a shrink, if you'll pardon the expression, and just keep pushing and coaxing, because that won't work. My oldest daughter ... knows that, too. The door is always open. I mean, you can keep repeating it, every month, you know: 'you need to talk about it,' no... you need to be there when she needs you, I think. Then you need to face up to it and not push it aside."

2. Answering questions at the child's pace
   "If he had questions, then you try to answer them as clearly and completely as possible, and honestly, too. I feel that is really important."

3. Guiding confrontation with reminders

"And we deliberately did not watch it on TV, and we kept saying to her 'well, we have it,' we had put some things on DVD, and some things are still on the internet, you know, 'you can watch it if you want, but you don't have to.' And then all of a sudden she would want to watch it in the afternoon, when no one was around, you know."

4. Protecting from unnecessary harm

"And we told her and we let the school know, 'the hearing is scheduled for then-and-then so watch out for news crews' 'cause the network wanted to send cameras again. I did send an e-mail telling them that we didn't want any camera crews. In the end they didn't show up."

5. Hiding own distress

"The first time he played soccer, he was only allowed to kick the ball over the goal, I was there on the sideline and I put on my sunglasses and I sat there and cried and cried, thinking 'there he goes, please let it go well'. A kid can feel that, you don't need to say it. I went and sat somewhere else, far away."

6. Searching for help

"[The reason for finding a therapist was] that she really was sleeping poorly and she was frightened, didn't want to be alone. I had to be with her constantly, you know, she didn't want to be alone. She was like that in the hospital, too, but then I could be with her all the time. That was great... But back home it was the same story, you know, so she wanted me to be with her all night long, lying next to her. So that was, you know, I mean that needed to be looked into."

7. Undertaking symbolic activities

"We made sure they were really involved in [the funeral], they made drawings and [Child] drew some letters on the card, but what she doesn't know is that those letters will be engraved on the gravestone, so she's sure to recognize it as her own handwriting."

8. Taking up normal routines

"I went with him to his swimming lesson the day after the funeral. That was really pretty quick, but I think he had also already been back to school before the funeral. So that all happened really fast, we got him back into his regular routine since his house and all his things were gone. And that alone is so horrible that we thought 'Let's get him back into his normal routine as quickly as possible'."

9. Providing fun activities / enjoyable moments

"We really put a lot of time into them, so we didn't have to hang around at home but could do fun things on Saturdays. They really appreciated it, you know, they thought it was a lot of fun. We did absolutely everything we could for them, you know."

> *"[Removing] that band-aid [from his disfigured finger], yeah, that was very hard for him. So we took a photo while he didn't look. We put that photo at home 'When you think I want to see it you can go look at the photo. Then you know what your finger looks like, and you can say whether the band aid can go or not'. And eventually he said himself: 'Now I want to see the photo'."*

Parents protected their children from cues that they thought would be unhelpful for recovery, such as exposure to news crews. Parents also hid their own emotions from their children when they judged them too intense. For example, they hid tears until they were out of sight of the child. However, children appeared very sensitive to signals of parents' distress. Several parents coincidentally learned that their child knew about gruesome details they thought they had only spoken about with adults. In other cases, parents felt they were so overwhelmed by the event that they were not able to hide any feelings. A mother described that her son was heavily affected by his parents being 'off-track' and drunk. When children needed more help to come to terms with the event or when parents felt that they couldn't adequately support their children, parents searched for help, for example by contacting a social worker at school or a psychologist at the hospital:

> *"That [my daughter] just didn't want to go outside anymore, that was a reason for me to think 'Well, I don't know how to go about this, I want to get help because I can't do this myself'."*

A further strategy that parents used to support their child (and themselves) was to undertake symbolic activities. Again, they attempted to make the child feel in control. For example, they had children choose the colors for a painting related to the event. Or they made a scrap book of all the postcards that the child had received.

Many parents, whether they saw distress in their child or not, paid attention to taking up normal routines again, thereby providing a daily structure to rely on. Clinicians also supported parents in taking up a normal rhythm, which was valuable to parents. A mother told that the most important piece of advice the medical staff gave her was to pick up normal routines again and let her son go to school as soon as possible. Without the advice she would have kept him home for a much longer period of time. Finally, parents talked about their efforts to allow time for fun activities and enjoyable moments as a strategy to support their children.

Parents felt that their strategies helped their children recover or that they could have helped if they had been better aware of the needs. A father who felt confident about his and his wife's approach said:

> *"I think it's really to our credit too... We really tried hard to keep things as normal as possible for them."*

COMMENT

The purpose of the current study was to strengthen trauma-informed healthcare by exploring parents' strategies to promote the psychological recovery of their children after single-incident trauma. Parental responsivity was a core theme in the narratives, consisting of being aware of a child's needs and acting upon these needs. We distinguished five parental tactics to estimate the seriousness of posttraumatic stress reactions in children (to be aware) and nine behavioral strategies to assist children (to act upon needs). Central to responsivity were parents' attempts to follow children's pace while providing structure and guidance when necessary, or seeking help to do this. Parents felt that their capacity to be responsive was influenced by their own level of well-being or distress.

To our knowledge, this study is the first in-depth examination of a) parents' views on children's recovery across a wide range of traumatic experiences and b) parental strategies to promote psychological recovery after trauma. Although studies regarding other pediatric health issues (e.g., spina bifida[24]; diabetes[25]) showed the importance of parental acceptation and warmth, the area of positive parental behavior and parent-child interactions after trauma was uncovered. Meanwhile, several limitations of the study should be noted. We studied parents' perspectives. Although, in our view, their views have important clinical implications, these views may not directly translate to what actually happens or happened. Observation studies are needed. Second, we studied parents in a Western-European culture, from a Western-European perspective. Our findings cannot be generalized to other cultures. Third, our sample came from a single hospital setting. Even though the hospital has a tertiary referral function and therefore serves children all over the country, the generalizability of the results should be tested. Finally, we studied a sample of children exposed to single-incident trauma. Although this represents a large and sometimes under-recognized group of children confronted with adversity,[19] our findings should not be generalized to parents of children who have been traumatized chronically.

Our findings provide the basis for an extended version of Scheeringa and Zeanah's model of Relational PTSD,[17] including not only the withdrawn parent, the overprotective parent, and the frightening parent but also the responsive parent and his or her specific strategies. It could be called the model of Relational PTSD and Recovery (see Figure 7.1). As most children recover well and most parents do not develop clinical levels of PTSD after trauma, we have depicted the unresponsive styles in smaller boxes than the responsive style. Because parental behavior influences children also in other ways than through parenting (e.g., by modeling[11]), a direct arrow is shown between parent's and child's well-being. After empirical testing and accompanied by clear behavioral descriptions and questions about parental distress and parenting, this model can help health care professionals appraise parents' capacity to promote their children's recovery after psychological

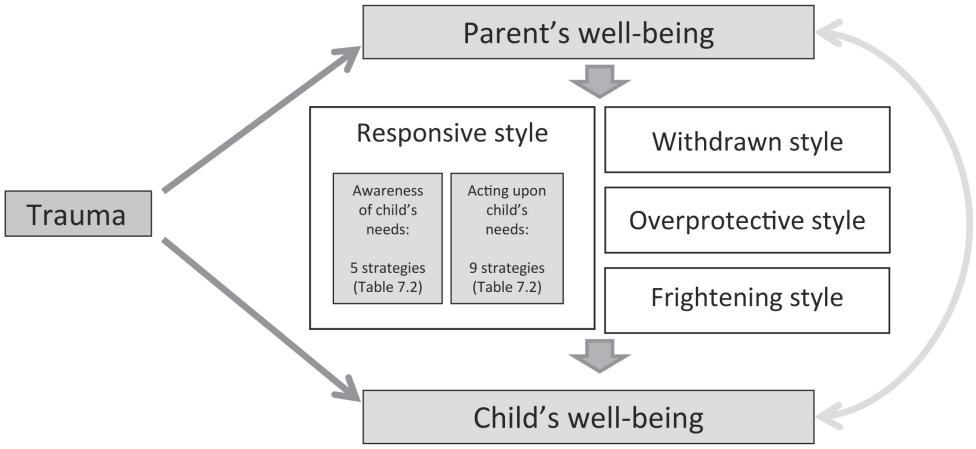

Figure 7.1 Model of Relational PTSD and Recovery.

trauma, strengthen parental responsivity, and refer families to specialized mental health care when necessary.

The clinical implication that such a model is needed follows from the finding that parenting responsively after trauma was felt as a challenge to the participants. Health care providers need to be aware of this in order to be responsive themselves and give parents the opportunity to share worries or thoughts. In addition, professionals should make sure that they are aligned with parents regarding the timing and content of information given to children about what happened exactly during the traumatic event or what is going to happen in medical procedures, of questions about experiences children had, and of confrontations with changed body images. This way, parental and professional strategies to promote children's recovery after trauma will support each other.

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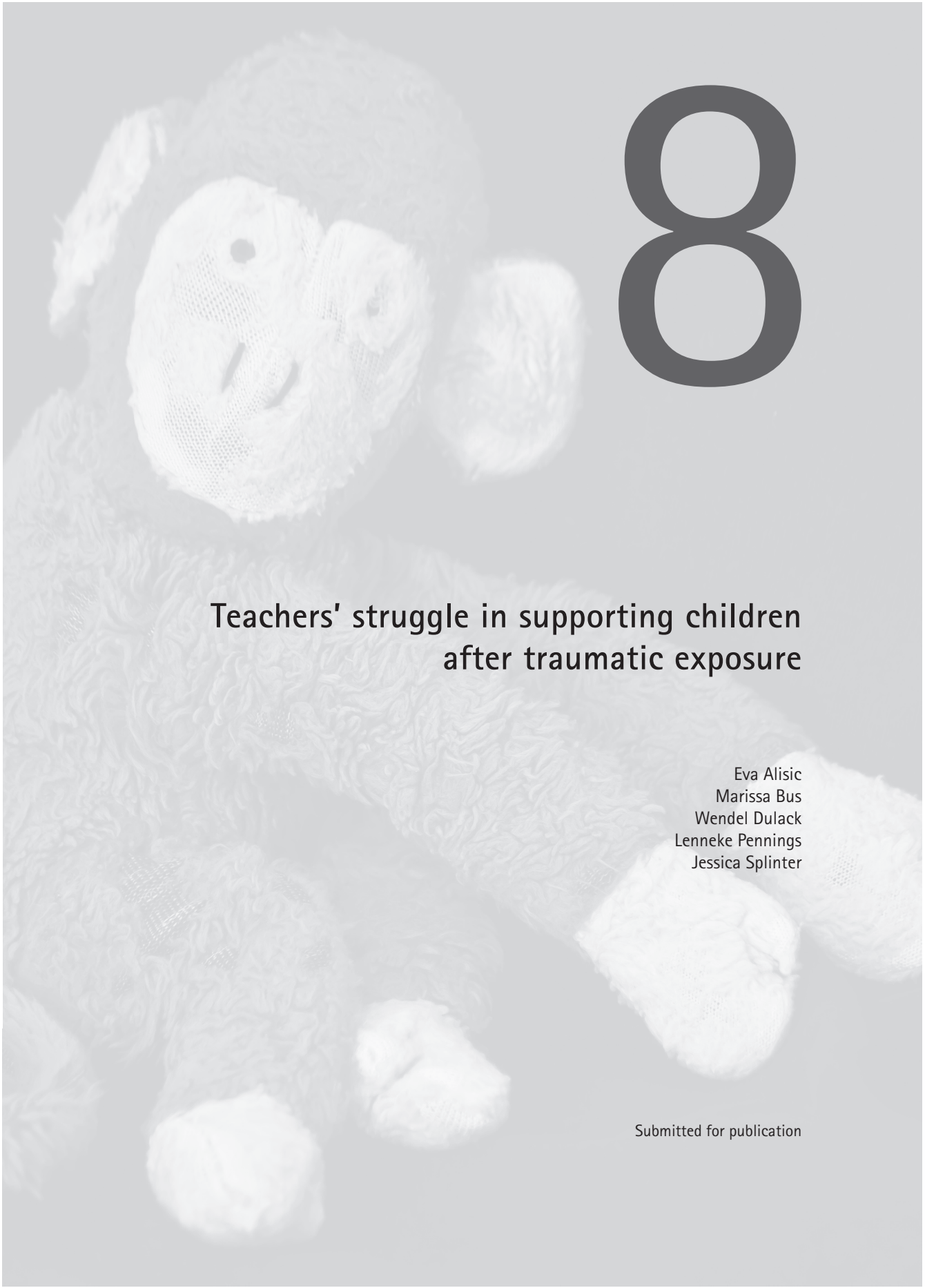

8

Teachers' struggle in supporting children after traumatic exposure

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ABSTRACT

Many children are exposed to extreme stressors such as disaster, sudden loss, and violence. Despite the known influence of educators on children's psychosocial development, research regarding the role of teachers in helping children after trauma is virtually non-existent. This study employed a mixed-methods approach to explore the perspectives of teachers on supporting children after traumatic exposure. The design consisted of a qualitative exploration (semi-structured interviews; *N* = 21) and a quantitative follow-up (a questionnaire in a national random sample; *N* = 765). Many teachers in elementary schools struggled with their role. They were searching for guidance on how to balance the needs of the children who have been exposed, against the needs of the other children in the classroom, as well as taking into account their own needs, while wishing for better knowledge and skills about helping children after trauma. We recommended better assistance for teachers in the form of policies, training, and informative materials.

INTRODUCTION

Teachers play an important role in children's life. They not only teach academic skills, but also serve as role models, regulate interactions between children, and provide emotional support.[1,2] Teacher-child relationships influence the development of children's competencies in both academic and behavioral domains.[2,3] Specifically, teachers can be instrumental in children's recovery from extreme stressors such as acts of violence and disaster.[4] However, the role of teachers is largely understudied in the field of traumatic stress. The present study examines the perspectives of teachers in elementary schools on supporting children after traumatic exposure.

Traumatic exposure in elementary school children

In the Diagnostic and Statistical Manual of Mental Disorders IV - Text Revision (DSM-IV-TR) traumatic exposure is defined by two criteria. First, "the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others" (also called the 'objective' criterion). Second, "the person's response involved intense fear, helplessness, or horror", which may be expressed by disorganized or agitated behavior in children (also called the 'subjective' criterion; American Psychiatric Association[5], p. 467). Examples of traumatic events studied in children are disaster (e.g., Thienkrua et al.[6] on the Tsunami), life-threatening accidents (e.g., Meiser-Stedman et al.[7] on serious road traffic accidents), violence (e.g., Thabet, Abed, & Vostanis[8] on war), and the sudden loss of a parent or sibling (e.g., Melhem et al.[9] on the sudden loss of a parent).

Few studies report statistics for rates of traumatic exposure in elementary school children. In a longitudinal American study in North Carolina, 54% of the 9 to 13 year olds had been exposed to at least one traumatic event.[10] Finkelhor, Omrod, Turner, and Hamby[11] carried out a nation-wide American survey on victimization. More than half (57%) of the children between 6 and 12 year old reported the experience of physical assault in the study year. Only a minority (29%) of the total study group of 2 to 17 year old children had no direct or indirect victimization experience (i.e., physical assault, property offense, child maltreatment, sexual victimization, or witness to violence/other form of indirect victimization).

Frans, Rimmö, Åberg, and Fredrikson[12] state that there is a cross-Atlantic difference in exposure, with high rates in the US and low rates in Europe. Indeed, a Dutch study in children aged 7 to 13 found a comparatively low proportion (14%) to be exposed to any severe stressor according to the objective DSM-IV criterion.[13] In contrast, in a slightly older Danish sample (13 to 15 year old), 87% of the girls and 78% of the boys reported victimization.[14] In this last study, the definition of a stressor was not restricted to the DSM criteria, but also included, for example, parental divorce. The methodology and outcomes

of these studies vary widely, but they all show that traumatic exposure is prevalent in elementary school children.

Children's recovery from trauma

Many children show distress shortly after exposure to an extreme stressor, which may also be visible in the classroom. Symptoms of reexperiencing the event are often reported,[15] for example in the form of recurrent and distressing recollections of the event that arise during quiet moments in class. Certain sounds, smells, sensations, people, and news stories can also trigger these recollections.[16] Reexperiencing symptoms frequently coexist with the avoidance of reminders.[e.g., 17] An example of avoidance would be the child who no longer wants to go to school on his bicycle after a serious road traffic accident. Children may also show numbing symptoms,[17] for example losing interest in former hobbies. Symptoms of hyperarousal, such as concentration difficulties and heightened irritability, may also be visible in the classroom.[15] In addition, children can have strong feelings of guilt, cling excessively to parents, show regressive behaviors, or develop new fears.[16,18-20]

While in most children these posttraumatic symptoms fade out over time, some children continue to experience severe distress. Posttraumatic Stress Disorder (PTSD) is the disorder most often associated with traumatic exposure. The disorder is characterized by a combination of reexperiencing, avoidance and numbing, and hyperarousal symptoms that causes significant distress during at least one month.[5] PTSD may persist for several years in children,[21] affecting their emotional, social, physical, and academic development.[22-25] Some factors appear to provide a risk for, or protection against, the development of PTSD in children. For example, repeated exposure to trauma and a history of anxiety heighten susceptibility to PTSD after trauma.[10] On the other hand, positive connections with caring and competent adults, in the family or in the community, represent one of the primary factors promoting children's resilience.[26] As such, teachers potentially have a seminal function in children's recovery from trauma.[27]

Teachers' role in children's recovery

Teachers can support children's recovery after trauma in several ways in their day-to-day work. Although little child trauma theory regards teachers, Prinstein et al.[4] proposed the construct of 'coping assistance', a form of social support that concentrates on and aids coping. The authors described three strategies that significant others (i.e., parents, peers, and teachers) use to help children cope with disaster. The first is emotional processing, which involves controlled and repeated exposure to various reminders. For example, Prinstein et al. reported of teachers who encouraged children to make event-related drawings. The second type of coping assistance is the reinstitution of familiar roles and

routines, leading to a gain in control over the stressful environment. Distraction is the third type of coping assistance. A number of reports[in 4] found that distraction is an effective approach for children to cope with severe stressors, and that distraction helps re-establish normal sleep patterns and reduces intrusive thoughts.

Besides providing coping assistance after trauma, teachers are in a position that enables them to identify problems in children that require mental health care, as they spend many hours with a child each week, and can see differences in behavior over time. When a child is confronted with a traumatic event during the school year, a teacher can compare behavior before and after the event. Even though teachers' reports of mental health problems may not be as accurate as children's self-reports or clinicians' reports,[28] teachers provide relevant additional information.[29] Moreover, schools are children's most important entry point to mental health care[30] and after several disasters, schools have even served as the center of (teacher-mediated) interventions for children.[27,31]

In addition to these trauma-specific roles, teachers may support vulnerable children by means of establishing a more general positive relationship with them. For example, Baker[3] found that children with behavior problems and a close teacher-child relationship were significantly advantaged relative to similarly affected peers who lacked such relationships. Decker, Dona, and Christenson[32] reported that elementary school children at risk of referral to special education showed increased positive social, behavioral, and engagement outcomes with a better student-teacher relationship.

Given the multitude of functions that teachers may have in supporting children's recovery after traumatic exposure, a principal determinant in teachers' actual behavior is their own perspective on their role.[cf. 33] Research has shown that teachers' opinions and experiences are of influence on children's outcomes. For example, Kochenderfer-Ladd and Pelletier[34] described how elementary school teachers' beliefs about bullying behaviors influenced their choice of strategies to manage bullying, which affected victimization rates in classrooms. Likewise, teachers' attitudes towards children with special needs have been found to influence students' success.[35]

In order to provide children in elementary school with optimal support and care, it is essential to know how teachers look at their role in supporting children after trauma. However, as has been reported for other psychosocial topics in schools,[e.g., 33,36,37] systematic research on teachers' perspectives is virtually non-existent. The scant literature that exists at present examines specific teacher-mediated interventions after disaster and terrorism.[e.g., 27,31,38,39] It does not look at teachers' views on their day-to-day work with children who have been exposed to a variety of traumatic events.

Study aim

The aim of the present study is to gain an understanding of teachers' perspectives on supporting children in elementary schools after traumatic exposure. A better understanding of their opinions, feelings, and needs will enable policy makers and mental health care professionals to provide teachers in elementary schools with the appropriate resources to help them facilitate children's recovery from trauma. Our primary research questions were: a) How do teachers in elementary schools experience supporting children after trauma? and b) To what extent are teachers' perspectives associated with their background characteristics, such as amount of teaching experience and gender?

GENERAL METHOD

In order to answer the research questions, this study sought to explore both teachers' views in depth, and to test these findings (and their associations with background characteristics) in a random sample that was sufficiently large to generalize the findings. Consequently we decided to use a mixed-methods approach. The design was exploratory sequential,[40] consisting of a qualitative exploration with a quantitative follow-up in a different sample, approved by the Medical Ethics Committee of the University Medical Center Utrecht.

QUALITATIVE EXPLORATION

In the qualitative exploration we aimed at interviewing a diverse group of teachers in a semi-structured format about their perspectives on working with children after trauma.

Method

Participants

To maximize the diversity in perspectives, we purposively sampled both male and female teachers, with varying levels of teaching experience (from fewer than three years to more than 10 years), from different schools (no more than two teachers from the same school), in a variety of neighborhoods (inner city as well as rural regions). Teachers were contacted through the school principal and received a letter explaining the purpose of the study and the informed consent procedure, followed by a phone call to answer any questions. Sixteen out of 27 principals (59%) agreed to invite teachers, and all teachers subsequently asked to participate consented to take part in the interviews. The main reason for school principals not to invite teachers was the heavy workload of their staff.

We interviewed 21 teachers from 13 schools; the teachers from three schools were not able to be interviewed within the study period. However, we reached saturation of information after 17 interviews, which made additional inclusions unnecessary. The mean age of the teachers was 35,5 years (range 22 – 55 years; SD = 11.69;). Five of them (24%) were male. Six teachers (29%) had no to little teaching experience (< 3 years), six (29%) had some experience (3-10 years), and nine (43%) had a lot of experience (>= 10 years). The mean number of years of experience was 9.9 (range 0.5 – 30 years; SD = 9.76). All teachers had interacted with one or more children who had been exposed to a traumatic event.

Interviews

The interviews were semi-structured. The topics in the interview guide (see Table 8.1) related to teachers' experiences with traumatized children, their strategies and feelings when working with these children, contact with parents, habits of guiding families to mental health care, exchange with colleagues regarding trauma, and information needs. The interviews were carried out by two pairs of trained student interviewers under the continuous supervision of the first author after the interview guide had been reviewed by an expert on counseling of elementary school children and had been critically examined in role-plays. The interviews lasted 31 minutes on average (ranging from 22 to 59 minutes). As a form of member checking (i.e., systematically obtaining informants' feedback on the data collection[41]), a written summary of the interview was sent to each teacher to be commented on. The teachers agreed with the summaries. The few comments ('I also said that ...') were taken into account in the analysis.

Table 8.1 Interview guide: general overview

General (e.g., what are your ideas about the topic of children and trauma?)
Experience and strategies (e.g., what is your experience with regard to children and trauma, can you give an example, what did you do, how did you feel in this situation, how did the child react, how did other children in the class react, how did parents react?)
School protocols (e.g., does your school have a protocol with regard to trauma, what does it look like, what do you think of it, what were the effects when using it for the child/the class/the parents, what are your habits of guiding families to mental health care?)
Colleagues (e.g., how do you exchange about the topic of children and trauma with colleagues, how do you support each other, what do you think of it?)
Needs (e.g., to what extent would you want to have more information than you have now, which kinds of situations would make you nervous?)

Analysis

Interviews were transcribed verbatim. Names were substituted with functional codes. The analytical procedure was based on the summative analysis approach proposed by Rapport,[42,43] which allows for maximization of individual researchers' contributions, while minimizing individual subjectivity. Each of the four interviewers independently summarized each of the 21 interviews, in exactly 20 rows of text (typed, Times New Roman, 12 points), and made an overall summary in exactly 25 rows of text (same format). This format forced the interviewers to make a selection within the narrative and to describe themes in a condensed fashion. The first author coded the summaries line-by-line using MAXQDA 2007,[44] a software package for qualitative analysis. The first author also counted how many of the four interviewers identified each theme as an indication of agreement. Finally, two sessions with the complete research team were devoted to discussing the code tree made of the themes, the proportions of identification of each theme, and the original materials, until consensus was reached.

Results

Prominent in the teachers' narratives was a struggle with their position as a teacher, with a lack of professional knowledge and know-how, and with the emotional burden that arises when providing support to children who had been exposed to trauma. These strongly interrelated themes are described in the remainder of this section.

Several teachers struggled with their *position* and wondered where their tasks as a teacher ended and where those of a social worker or psychologist started. They had the impression that teaching was moving away from teaching children academic skills, towards playing a major role in children's social and emotional development. Although some teachers felt this was an important and logical trend, others wanted to stick to teaching academic skills:

> *"I feel that in education, a teacher needs to watch out not to get too much of social work on his or her plate. Because our primary task is to teach, after all… in that respect I think that the boundaries in education are still very vague."*

Also, on a more practical level, teachers struggled with balancing individual children's needs and class' needs after traumatic exposure. They found it difficult to support a child who had been confronted with a severe stressor, while looking after the rest of the class at the same time. Several teachers provided examples of children who were overwhelmed by emotions during lessons and demanded extra attention, while the rest of the class had to take care of themselves. For example, a teacher said about a boy in her class:

> *"The first week that he was in my class, he did not want to do anything. He could only sit and cry and he wouldn't let me go away. I really had to hold him and hold his pencil; in those conditions he would write down some work. But most of the time he was just sitting and crying (…), so that is a lot of compromising between 'I want to give full attention to the kid because he needs it', and 'I just have to teach the class'. So it's difficult."*

On the other hand, finding a good trade-off between looking after a child and preventing this attention-giving from becoming too 'heavy' was difficult. Teachers did not want to focus too much on the traumatic experience and overlook other experiences or accomplishments of the child, because normal life should go on. However, they did not want to play down the experience of the child either. In addition, teachers wanted to 'be there' for a child, but felt this should not put the child in a special position that made him/her an outcast in the class, or interfere with general behavior rules in class. For example:

> *"I wanted to stick to normal rules with this child. He was a boy with some behavior problems so I had to correct him now and then. But I also wanted to be there for him. He lost his mother, so that's terribly sad… I asked myself regularly how to find that balance."*

Many teachers expressed *feeling a lack of competence* regarding how they should act when a child has been exposed to trauma. They felt they did not have enough specific knowledge of traumatic stress. In particular, they had questions about how they could support the child and to what extent they should discuss the experience with the child and the class. In terms of coping assistance, the teachers touched in the interviews on emotional processing (e.g., talking about the event with the child) and normalizing (e.g., picking up daily routines with the child), and incidentally on distraction, but their narratives were dominated by doubts. Several teachers explained that they discussed the experience with the child on the child's initiative, but were unsure whether they should do nothing when the child did not start a conversation about it.

They were also uncertain about when they should decide that a child needs specialized mental health care, and subsequently, where they could find information about mental health care possibilities for a child and his/her family. A teacher who had two children in his class who had been exposed to a traumatic event, put his questions this way:

> *"But it leaves you with 'Yes, what to do now actually? What to do about it? Is something really wrong with these boys? Or do they just work through it their way? And what should you keep an eye on? And when would it be necessary to get help? And if so, where to get it?' I don't know."*

It was a challenge for teachers to find a balance between being committed to the well-being of a child and keeping enough distance in order to avoid too strong an *emotional*

involvement. A few teachers referred to being reminded of their own history of trauma as an emotional experience. For example, a teacher said that the experience of a child reactivated memories of a loss she had faced, which overwhelmed her and made her less available to the child than she wanted to be. Another important source for 'taking the problems home' was feeling unable to help, either because of unfruitful contacts with parents or because of a lack of knowledge or skills:

> *"I keep it with me, you know, it touches you anyway. It's about kids and sometimes complete families. It makes you think: if I could just take them home in my arms. Because you want them to have a much better life … I take that with me. It makes me think 'terrible, horrible that this happens'. … It's that feeling of powerlessness and sometimes of not knowing which steps to take exactly."*

In summary, the teachers were searching for a balance in answering the needs of the children who were exposed, of the other children in the classroom, and of themselves, while wishing for better knowledge and skills about helping children after trauma.

QUANTITATIVE FOLLOW-UP

The purpose of the quantitative follow-up in this mixed-methods design was to examine whether the struggles that the interviewed teachers had reported with supporting children after trauma, could be generalized to a large group of teachers. We defined the teachers' struggles as: the uncertainties and difficulties that teachers face in balancing the needs of individual children versus the rest of the class, while taking into account their own needs, including questions about their own roles as teachers and of best practices with regard to supporting children after trauma. In addition, this study aimed to explore whether certain groups of teachers were struggling more than others. We hypothesized that teachers with more experience in teaching and working with traumatized children, and teachers with more trauma-specific training, would struggle less than teachers with less experience and training. Although we did not have a clear hypothesis about gender differences, these were tested as well.

Method

Participants

As of May 2010, 6,926 elementary schools were registered at the financial department of the Department of Education of the Netherlands. The 37 schools that had participated in the interviews and/or an earlier study on child trauma[13] were excluded from the list, in order to avoid a bias in teachers' answers. From the remaining pool of 6,889 institutions a contact list of 2000 schools was drawn-up, using the random sampling function of SPSS 17.[45]

A questionnaire and answer envelope were sent to 500 teachers in each of the last four grades of these elementary schools (2,000 in total; children are between 8 and 12 years old in these grades). The questionnaires were anonymous.

In total, 765 teachers (27% male) filled out the questionnaire, a response rate of 38%. The mean age of the teachers was 43.0 (range 18–64; *SD* = 12.07), and the mean number of years of teaching experience was 18.4 (range 1–43; *SD* = 12.2). Most teachers (89%) had directly worked with one or more children who had been confronted with a potentially traumatic event. One in 11 teachers (9%) had participated in a training they identified as relevant to supporting children after trauma in the last three years, varying from a one hour session to a program lasting over several months.

Measure

The questionnaire contained nine statements covering the themes that had emerged in the interviews. For the development of the questionnaire, several items were tested in a 'think aloud protocol'[46] with a child trauma expert and two teachers. After revising the questions that were not clear, we piloted the questionnaire in a group of 31 teachers who had been interviewed for the qualitative exploration along with some of their colleagues, who were asked for their feedback (none of these teachers took part in the subsequent data collection process). The questionnaire was finalized using this feedback.

The questionnaire started with a general introduction of two case-study examples, a girl (Janne) who had witnessed severe violence and a boy (Joris) who had survived a serious road traffic accident. An example of one of the nine statements that followed is: "With children like Janne and Joris, I find it … to balance looking after the child and looking after the class". Statements were scored on a six-point Likert scale, ranging from 'not difficult at all (1)' to 'extremely difficult (6)'. We considered scores 4–6 to refer to a relevant struggle. See Table 8.2 for the other items. The reliability of the measure was good (Cronbach alpha = .82). After a scree plot in an exploratory factor analysis revealed that the scale consisted of a single factor, confirmatory principal axis factoring showed that every item loaded at least 0.30 on this factor (ranging from .31 to .73).

We carried out descriptive analyses to show the proportion of teachers endorsing certain dilemmas. Next, we computed a total 'struggle score' (scores could range between 9 and 54; scores ≥ 32 corresponded to experiencing a struggle). Before carrying out a regression analysis, multicollinearity was tested by means of correlations between the background characteristics (years of teaching experience, attendance at trauma-focused training in the past three years, number of traumatized children worked with, and gender). Correlations were ≤ .30, so multicollinearity was not a problem (cf. Field[47], p.175). We carried out a multiple regression analysis with the total struggle score as the dependent variable and the remaining background characteristics as independent variables, entered in one block.

Results

The total struggle score ranged from 10 to 50, with a mean of 29.8 (*SD* = 7.37). For 42% of the teachers their mean score corresponded to experiencing a struggle. The endorsement of experiencing a struggle on each of the nine items is shown in Table 8.2. On each item, at least one in four teachers reported a serious difficulty, with percentages ranging up to 63%. In particular, many teachers found it difficult not to get emotionally involved too much; to find their position as a teacher of academic skills versus mental health care provider: to know the best ways to support children after trauma; to know when children need professional mental health care; and to know where they could find information about traumatic stress. For each of these five aspects, at least half of the teachers experienced difficulties.

In the multiple regression analysis (see Table 8.3), the teachers' struggle depended significantly and negatively on the amount of teaching experience, whether they had attended trauma-focused training in the past three years, and the number of traumatized children they had worked with. Gender was non-significant. The model explained 4% in the variance in the experience of a struggle: a small effect.

Table 8.2 Endorsement of items regarding teachers' struggle in supporting children after trauma

Questionnaire item "For me, with children like Janne and Joris, it is (difficult) to …"		*M*	*SD*	% experiencing a struggle[a]
1.	… balance looking after the child and looking after the rest of the class	2.7	1.14	25.4
2.	… balance looking after the child and avoiding to put him/her in a special position	2.8	1.17	28.4
3.	… balance looking after the child and making the situation too heavy	3.0	1.22	33.5
4.	… avoid 'taking the problems home'	3.5	1.48	50.3
5.	… decide where my task ends and the task of a social worker or psychologist begins	3.8	1.32	60.2
6.	… know what is best for me to do to support them	3.6	1.25	51.3
7.	… know when they need mental health care to recover	3.9	1.28	62.8
8.	… know what to discuss about the trauma with the children themselves and the class	3.1	1.28	35.7
9.	… know where to get answers to my own/parents'/children's questions	3.5	1.40	51.0

Note: *N* = 762–765. All statements were linked to the cases of Janne and Joris, who had been exposed to severe violence and a serious road traffic accident, respectively. [a]Referring to scores 4, 5, and 6 on a scale ranging from 1 (not difficult at all) to 6 (extremely difficult).

Table 8.3 Predictors of teachers' struggle in a multiple regression analysis

Predictor variable	*B*	*SE B*	β
Constant	31.27	.76	
Amount of teaching experience (in years)	-.07	.02	-.12*
Number of traumatized children worked with	-2.35	.91	-.09*
Attendance at trauma-focused training in past 3 years[a]	-.08	.03	-.10*
Gender[b]	.74	.63	.05

Note: N = 739, Adjusted R^2 = 4%. * $p \leq .01$. [a]0 = did not attend, 1 = attended. [b]0 = male, 1 = female.

GENERAL DISCUSSION

This study uncovers a largely understudied but important topic: teachers' perspectives on supporting children who have been exposed to trauma. Although many children are victimized and teachers play an important role in children's lives, research examining teachers' views is virtually non-existent. We explored teachers' perspectives in a mixed-methods design consisting of a qualitative exploration (with semi-structured interviews) and a quantitative follow-up (with a questionnaire in a national random sample). The main finding of this study is that many teachers in elementary schools struggle with their role in supporting children after traumatic exposure. They are searching for a balance in answering the needs of the children who are exposed, of the other children in the classroom, and of themselves, while wishing for better knowledge and skills to help children after trauma. The qualitative findings were confirmed in the quantitative follow-up, which provided further insight in the most important dilemmas and in the associations with teaching experience and gender. Gender did not play a role in teachers' struggle but teaching experience (both general teaching experience and specific experience with traumatized children) did, although the effect was small.

Even though all dilemmas that came up in the qualitative study were endorsed by teachers in the national random sample, differences existed in the extent to which certain problems were experienced. One of the prominent themes concerned the boundary between the tasks of a teacher and those of a mental health care provider. Ko et al.[48] observed that trauma confronts schools with the dilemma of how to balance their mission of education with the fact that many students need help in dealing with traumatic stress, in order to be able to engage in learning. The present study shows that this dilemma not only exists at the school level but also at the individual teacher's level. Perceptions of teacher roles and tasks are important for children's outcomes.[cf. 34,35]

In organizational psychology, a distinction is made between in-role and extra-role behaviors.[49] An example of extra-role behavior may be helping a colleague with work

overload or preparing individualized assignments for students.[50] A number of teachers in our interviews described providing support after traumatic exposure as an extra-role behavior, which they preferred to leave to mental health care professionals. Somech and Oplatka[37] reported that the extent to which teachers perceived handling school violence as one of their in-role tasks and not a voluntary or extra-role behavior, presented a significant favorable influence on actual school violence. Likewise, when schools and teachers explicitly consider post-trauma support (e.g., signaling serious coping problems and informing about mental health care possibilities) as a part of their duty, this will probably exert a positive influence on child well-being.

However, there is some evidence that teachers' attitudes towards taking up psychosocial tasks are mediated by their feelings of competency.[51] In the present study, many teachers did not feel competent. Prominent questions which teachers struggled with regarded how to support children after trauma, when to decide that a child needs professional mental health care, and where to get information. Although the teachers touched on emotional processing, normalizing, and incidentally on providing distraction as forms of coping assistance[4] in the interviews, their narratives were dominated by a need for more clarity and confidence in their role and a need for more knowledge about these strategies. The relationship between teachers' feelings of competence regarding supporting children after trauma and their attitudes toward providing this support will need further research.

Another aspect of this study's findings related to emotional involvement. In other professions (e.g., first responders, mental health care providers), the risks of compassion fatigue and secondary traumatization have been described.[e.g., 52,53] When teachers experience secondary trauma, both their own health and the support they can give to children are at risk. Scheeringa and Zeanah[54] describe the construct of 'Relational PTSD', in which the symptoms of a parent exacerbate the stress reactions in children. One of the processes described, is the one where a parent is unavailable for a child because of own emotions. This pattern can be translated to the teacher-child relationship, although we expect the associations to be weaker. Traumatic exposure in a child may remind a teacher of his or her own traumatic history, and therefore endanger both the teacher's functioning and the teacher-child relationship.

The amount of experience with traumatized children, teaching, and trauma-focused training were negatively related to teachers' struggles with their position and functioning. However, these variables explained only a very small part of the variance in teachers' struggle experiences. It is possible that a more general feeling of incompetence or role uncertainty haunts teachers with regard to psychosocial issues. For example, Horne and Timmons[55] reported on teachers' needs for training and resources with regard to including children with special needs in the classroom. Kos et al.[51] described that there is room for improvement in teachers' knowledge and training regarding ADHD. According to Klassen

et al.,[56] teachers' self-efficacy beliefs play a strong role in influencing student learning and teachers' job commitment. The construct of self-efficacy may be helpful in better understanding variations in teachers' struggle in supporting children after trauma.

Strengths and limitations

Apart from drawing attention to an under-researched domain of child traumatic stress, the present study's main strength lies in the application of a mixed methods design, which allows for triangulation of the findings.[57] The summative analysis of the interviews enabled an examination of the views of a diverse group of teachers in depth, while the national sample that filled out the questionnaire allowed for further testing and generalization of the thematic findings.

This study has several limitations that should be kept in mind. First, because we examined teachers' views, it is not possible to draw firm conclusions about behavior. It would be valuable to measure actual behavior in class to know what behavior teachers are actually showing. From the present data it cannot be determined whether those teachers with more confidence are actually better at supporting children, or, in contrast, are simply less reflective on their practice. Second, it is possible that the samples used, both in the qualitative and in the quantitative part, were biased towards those teachers who have an interest in the topic.[cf. 33] The response rate in the quantitative part was reasonable for a questionnaire without any follow-up by phone call or mail (because of the anonymity) (see e.g., Rimm-Kaufman, Pianta, & Cox[58]), but future studies may want to offer confidentiality instead of anonymity, contact non-respondents, and check for non-response patterns. On the other hand, it is possible that we were able to reach teachers who would not have responded if identification was required because of fear of their school principals acquiring their responses. Third, we constructed a new instrument to measure teachers' struggles with supporting children after trauma. Although the preliminary psychometric characteristics were promising, the measure should be further validated and probably extended to examine specific dilemmas into more detail. Finally, while the question relating to trauma-specific training was open-ended regarding the number of hours of education received, we did not ask participants to describe the content of the training. This would be of value in future studies.

Practical implications

The study yields several practical implications. First, there is a need for clear policies regarding teachers' roles. As teachers have been shown to be instrumental in promoting children's well-being, in our view, child trauma support is part of the job. This does not mean that teachers should be trained as therapists, but future teachers need to learn how to optimally support exposed children in day-to-day school life. They could be provided

with knowledge and skills regarding how to facilitate coping when working with children in the classroom, how to recognize symptoms of adaptive and maladaptive coping, where to find information about mental health care possibilities for children and their families, and how take care of themselves under stressful conditions. It would be valuable to provide current teachers with continuing education on these topics. The need for specific training should be discussed on a governmental level and be translated to schools.

Meanwhile, materials could be developed to inform teachers at a practical level about strategies to facilitate children's recovery, closely matching teachers' wishes regarding learning. An example is the Traumatic Stress Toolkit for Educators from the American National Child Traumatic Stress Network.[59] Our team is currently developing similar informative materials for Dutch teachers, in close cooperation with the teachers who took part in the interviews. A pilot quasi-experiment (posttest only) with a preliminary version of the materials indicated that teachers who used them showed a significantly better understanding of what support children need after trauma than teachers who did not use them.[60] Further development and testing will be necessary, with a specific focus on dissemination and securing long-term learning effects.

Future research

We observed a lack of theory and research regarding the role of teachers in children's recovery from trauma. Future work on this issue will be helpful, and may draw from a combination of attachment theory, social learning theory, the model of relational PTSD, secondary traumatization, and organizational behavior theory (see e.g., Belogolovsky & Somech[50]; Hamre & Pianta[2]; Scheeringa & Zeanah[54]). This can lead to advancements in several fields. The first regards teacher behavior after traumatic exposure in children: what do teachers actually do to support children and what are the effects? Second, to what extent does a teacher's own traumatic history, personality, role-expectations, and teaching capacities (e.g., class management skills) influence the way they effectively support children after trauma? One of the hypotheses that should be tested in this respect is whether teachers' feelings of self-efficacy with regard to supporting children after severe stressors predicts their identification of providing such support as an in-role behavior (i.e., teachers with a high self-efficacy perception should be more inclined to define providing support after trauma as part of their job). A final, but important, question is: How can teachers effectively be prepared and assisted? Studying these questions will advance the understanding of teachers' role and perspectives, and the possibility of supporting their functioning when they assist children who have been confronted with trauma.

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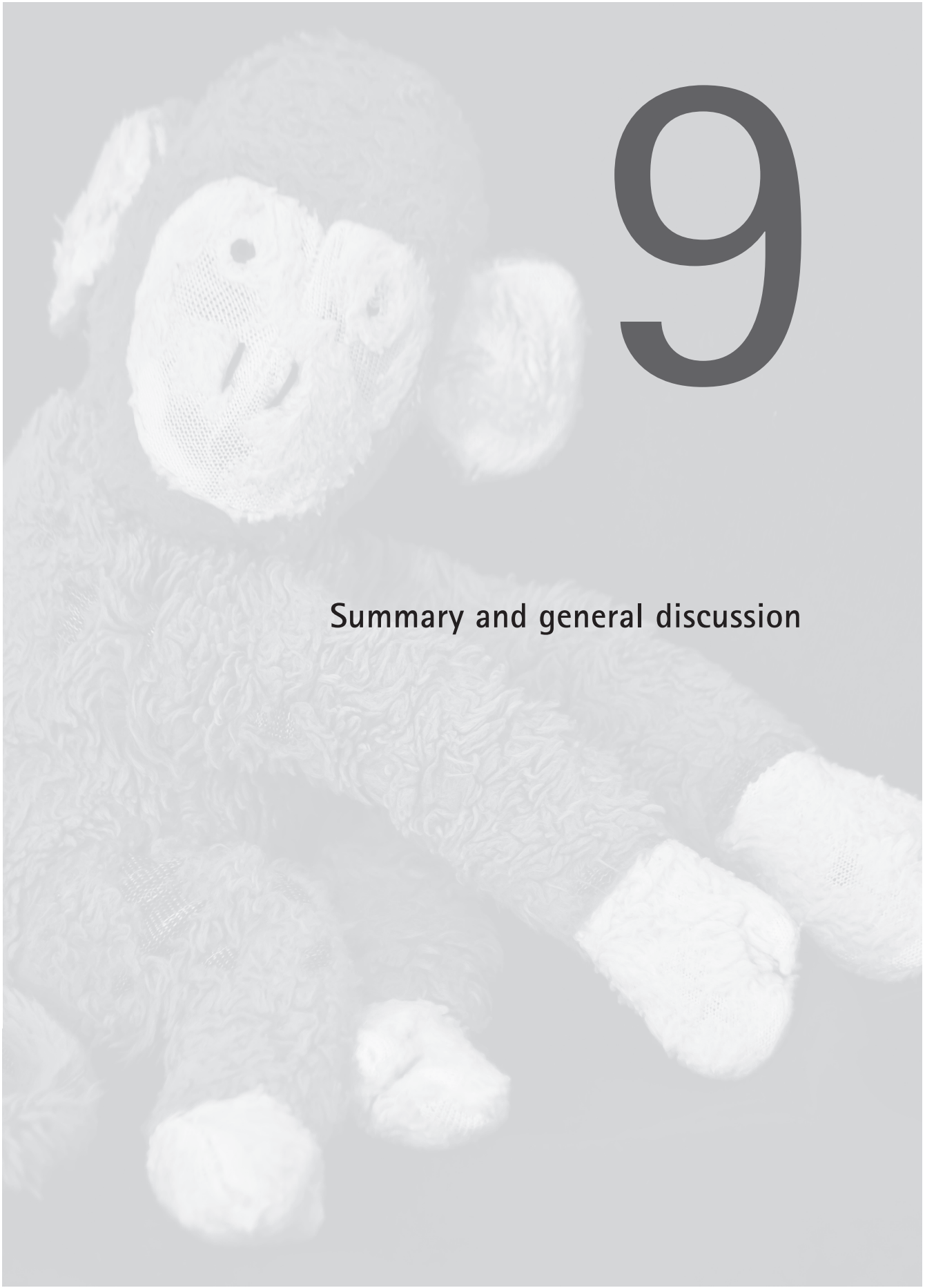

9

Summary and general discussion

INTRODUCTION

This dissertation focused on the theme of *children and trauma*, and in particular on children's exposure to and recovery from severe stressors. In short, the rationale for the project came from a) indications that many children are confronted with traumatic events; b) reports that trauma can lead to serious and long-lasting consequences in children; c) the view that there is more to trauma than PTSD alone; and d) the identification of several gaps in knowledge that need to be filled in order to take better, more tailored care of children. Existing child trauma theory is scant. The purpose of the dissertation was to generate a broad overview of children's exposure to and recovery from trauma in order to promote theory building and the design of prevention and intervention activities. The project embraced various methods and viewpoints, and specifically focused on children in the last four years of elementary school. The present chapter provides a summary of the main findings of the dissertation and a discussion of several cross-cutting issues.

SUMMARY OF MAIN FINDINGS

Exposure to trauma and psychosocial well-being in the general population

In order to direct prevention efforts, it is necessary to know how many children are confronted with traumatic events and which children are most at risk of being exposed. The prevalence of traumatic exposure in children in the Netherlands was unknown and the few studies that had been conducted to examine the relationship between demographic factors and exposure to trauma in children produced inconsistent results. In Chapter 2, we examined this prevalence and its associations with age, gender, ethnicity, and (urban vs. rural) region of residence. In our general population sample of 1,770 children in the last four grades of elementary school, 14% of the respondents reported exposure as defined by the A1 criterion for PTSD of the DSM-IV.[1] They most frequently gave an account of the sudden death or serious injury of a loved one. The prevalence rate was rather low compared to the rates found in American studies[e.g., 2] and matched more closely with a German study.[3] This supports Frans et al.'s suggestion of a cross-Atlantic difference, with higher rates of exposure in the US than in Europe.[4] Nevertheless, 14% corresponds to about four children in an average classroom in the Netherlands, a substantial number. Gender, ethnicity, and region of residence did not emerge as significant risk factors, indicating that children in rural areas and children with an autochthonous background are not immune to exposure in the Netherlands. This may coincide with the fact that we found non-violent events to be most prevalent in our sample. In earlier reports, differences had mainly been identified for exposure to violence.[e.g., 5] Age was significantly and positively associated with exposure. We suggested that older children may simply have had more time to become exposed but that they may also be more vulnerable because of their increased autonomy (e.g., in traveling to school).

In Chapter 3, we examined the extent to which posttraumatic stress reactions (i.e., the broad range of symptoms that children may experience after traumatic exposure), posttraumatic growth (i.e., the experience of positive change as a result of the struggle with highly challenging life crises), and quality of life (i.e., general well-being in daily life) were related to each other and to traumatic exposure in children. These psychosocial constructs appeared to be relevant in the literature[e.g.,6-8] but their interrelations and their relation to traumatic exposure in a general population sample of children had rarely, if ever, been studied. In our sample (see Chapter 2), posttraumatic stress reactions turned out to be positively related to posttraumatic growth. We concluded that negative and positive psychological sequelae of trauma in children should not be seen as opposites on a single continuum but rather as co-existent constructs. Posttraumatic stress and quality of life were negatively related. Our results suggested that in elementary school age children, the consequences of traumatic exposure extend beyond specific symptoms to broader areas of life. Posttraumatic growth and quality of life were related positively when controlling for posttraumatic stress reactions and negatively when not. This confirmed the existence of a positive association but suggested that the presence of posttraumatic stress reactions overrules its direction. Children who were exposed to trauma reported more posttraumatic stress reactions, more posttraumatic growth, and lower quality of life than non-exposed children. However, the effect sizes were small, possibly because children typically respond well to difficult life circumstances[2] or because mediator and moderator variables (e.g., the appraisal of the event and parental behavior) play a role.[9]

Assessment of posttraumatic stress reactions

In Chapter 4 we presented the development and validation of the Children's Responses to Trauma Inventory (CRTI), a self-report measure for posttraumatic stress reactions in children. The CRTI is designed to measure the broad spectrum of posttraumatic stress symptoms observed in children (i.e., PTSD symptoms and other child-specific reactions such as regressive behavior and separation anxiety[7]), in a child-friendly way. We first examined the reliability and validity of the original CRTI[10] through secondary data-analysis of four clinical and non-clinical samples (N = 96) and expert consultation. The total scale proved to be reliable and showed convergent and discriminant validity against internalizing and externalizing behavior scales, respectively. However, there was also room for improvement. In particular, the reliability of the subscale for avoidant reactions was rather low, the wording of a few items was too complicated, and a number of PTSD symptoms were not taken into account. After we revised the CRTI it demonstrated good to excellent reliability with the 243 children who had reported exposure to trauma in the study described in Chapter 2. Convergent validity was established against another measure for posttraumatic stress and a scale for psychological well-being. Although we considered

the results to be preliminary due to the rather narrow age range of the sample and the use of self-report measures, we concluded that the CRTI was a promising child-oriented instrument.

Theory use and theory validation in longitudinal studies

In Chapter 5, our aim was to contribute to child trauma theory by focusing on theory use in longitudinal studies on risk and protective factors for posttraumatic stress and on theory validation based on the findings of these studies. Theory use had not been studied systematically before and the rare earlier meta-analyses of predictors of posttraumatic stress in children[11,12] had several drawbacks (e.g., the inclusion of cross-sectional relations and the restriction to illness and injury studies). We retrieved 40 studies published in the past 30 years that examined predictors (measured within three months posttrauma) of 'long-term' posttraumatic stress (measured at three or more months posttrauma) in children exposed to a wide range of traumatic events. Explicit theoretical frameworks were present in a minority of the studies only. This is in line with Toracco's suggestion[13] that the predominance of non-theoretical research is a general phenomenon. When theory was explicitly referred to, general risk factor models,[e.g., 14] biological theories,[e.g., 15] and cognitive models[e.g., 16] were most present. The most notable predictors of long-term posttraumatic stress in children were symptoms of acute (measured 0-1 month posttrauma) and short-term posttraumatic stress (measured 1-3 months posttrauma), depression, anxiety, and parental posttraumatic stress. Female gender, injury severity, duration of hospitalization, and heart rate shortly after admission to the hospital accounted for small effects. Age, minority status, and socioeconomic status were not significantly related to long-term posttraumatic stress reactions in children. Since many other variables were not studied frequently enough to compute effect sizes, existing theoretical frameworks could only be partially confirmed or falsified. In particular, protective factors were under-researched. Our findings suggested that certain child demographics (age, minority status, socioeconomic status) need to be emphasized less as direct risk factors, while fear conditioning models[15] received preliminary confirmation. An important finding regarded the predictive power of parental distress. Scheeringa and Zeanah[17] have developed a model of 'Relational PTSD', which describes three styles of distressed parents who exacerbate the symptoms of young children (i.e., the withdrawn parent, the overprotective parent, and the frightening parent). Our findings justify further research into this model for children of all ages.

Perspectives on trauma and recovery: children, parents, and teachers

In order to build up a broad understanding of children's recovery from trauma that goes 'beyond measures and numbers',[18] it is valuable to complement quantitative findings with in-depth, qualitative research. The aim of Chapter 6 was to explore children's experiences of recovery after single-incident trauma. So far, qualitative, child-centered studies have

been thin on the ground and very specific (focusing on one type of event or on one type of outcome, or based on small samples). From our interviews with 25 children with a diverse range of experiences, several themes emerged. Even though the children had been exposed to single traumatic events, the aftermath was long and involved secondary stressors, shattered assumptions about the world, and feelings of distress. The findings hint at the usefulness of the newly developed notion of 'minimal learning', which explains that children try to keep their self-image intact in the face of adversity, for example by attributing their own acts externally.[19] In general the children experienced a step-by-step recovery and, although only a few indications of posttraumatic growth were explicit, often identified positive elements within the negative experience. They talked spontaneously and profusely about the support they received from friends, parents, and cuddly toys. While social support is an understudied topic in traumatized children (see Chapter 5), our findings show that the topic deserves more research and clinical attention. The children displayed a wide variety of coping behaviors, which were categorized as concentrating on the normal and the positive, avoiding risks and reminders, actively working through the trauma, and seeking support. This categorization comes close to the results from a factor analytic study in a general population of children[20] and should be tested, and subsequently used, with children who have been confronted with severe stressors.

The purpose of Chapter 7 was to shed more light on the mechanisms by which parents experience and influence their children's recovery after a traumatic event. From the meta-analysis in Chapter 5 it became clear that parents' distress after trauma significantly contributed to the prediction of children's long-term posttraumatic stress symptoms. Meanwhile, the interactions between parents and children after trauma, especially supportive interactions, have been seriously understudied.[21] To our knowledge, parents' views on the recovery of children after a wide range of single trauma experiences had never been systematically investigated. Our interviews with 33 parents (of 25 children) yielded 'responsive parenting' as playing a central role in children's recovery. Parental responsivity after trauma consisted of a) being aware of a child's needs and b) acting upon these needs. Fourteen strategies for parenting responsively, such as comparing behavior with siblings' behavior and providing opportunities to talk, were identified. Central to responsivity were parents' attempts to follow their child's pace while providing structure and guidance when necessary, or seeking help to do this. The findings provide a non-pathological extension to Scheeringa and Zeanah's model of Relational PTSD.[17] In addition, the parents felt that their capacity to be responsive was influenced by their own level of distress, which is in line with the same model and with the results from our meta-analysis. We proposed a model of 'Relational PTSD and Recovery'.

Chapter 8 covered teachers' perspectives on supporting children who have been exposed to trauma. Although a substantial number of children are victimized (see Chapter 2) and teachers play an important role in children's lives,[e.g., 22] knowledge of teachers' views is

lacking. We conducted a mixed-methods study of teachers in elementary schools (highest four grades), consisting of a qualitative exploration (semi-structured interviews with 21 teachers) and a quantitative follow-up (a questionnaire based on the results of the interviews, filled out by a random national sample of 765 teachers). The main finding was that many teachers struggled with their role in supporting children after traumatic exposure. They were searching for guidance on how to balance the needs of the children who have been exposed against the needs of the other children in the classroom, as well as taking into account their own needs. They wished for better knowledge and skills with which to help children after trauma. One of the dilemmas faced by the teachers (how to balance a mission of education with a need to help students in dealing with traumatic stress) had been identified at the school level before[23] but not yet at the individual teacher's level. In addition, we examined associations between teachers' struggles (operationalized as the sum of the nine dilemmas and uncertainties that the teachers reported) on the one hand and teaching experience, training, and gender on the other hand. Gender did not play a role in teachers' struggles but teaching experience (both general teaching experience and specific experience with traumatized children) and training on the topic did, although the effect was small. We recommended better assistance for teachers in the form of policies, training, and informative materials.

GENERAL DISCUSSION

Several issues were present throughout the entire dissertation project and are, or should be, currently debated in the literature. We start this discussion with the question of whether we should conduct child trauma research at all, from an ethical point of view. Subsequently, we will turn to the definition of traumatic exposure and the debate on posttraumatic stress symptoms in children. We present our input on child trauma theory as well as our views on how child trauma theory could be developed. After a discussion of the clinical implications and practical outcomes of the project, we formulate a general conclusion. Relevant research 'spin-offs' of the study are presented in boxes.

Ethical questions

Ethical questions have been posed for every empirical part of the dissertation, by ourselves as well as by ethical committees. Is it really necessary to conduct these studies? Do we retraumatize children by subjecting them to research? It is important to weigh the risks for research participants against the benefits to them and to the children who will be exposed to trauma in the future. However, the decision-making process of researchers and institutional review boards currently relies for a large part on a mix of personal and professional experience, plus informed speculation about possible effects on participants, instead of on a large base of scientific findings.[24]

In our view, the main arguments for conducting studies of traumatized children are threefold. First, it is necessary to know what processes take place in children who have been exposed and what (and how) interventions work out. Intuitive feelings about how people who are exposed to stressful events might react or which intervention might help do not always turn out to be correct. An example concerns certain forms of Critical Incident Stress Debriefing, which turned out to show no effect, or even a harmful one, in adults[25] (note that this finding should not be generalized to other forms of psychological first aid).

Second, it is necessary to perform trauma research studies *with* children instead of *on* children (by proxy). Children are the experts on their own feelings and thoughts. In order to understand their world it is necessary to ask them about it. It is not enough to pose questions to parents and significant others because children often try not to upset them after trauma.[26] Asking children about their experiences is also important in getting them out of their role as 'silent consumers';[27,28] it enables them to actively contribute to procedures in (mental) health care.

Third, making survivors think of an event in the past is not the same as subjecting them to the event again. The emotions that arise, if any, differ from the acute emotions of a traumatic event.[29] For example, the data collection for this dissertation was done in safe and quiet areas. The children were 'in control'; whenever necessary, they could end the interview both verbally and non-verbally (with a road traffic 'stop' sign). Also, the children interviewed had ended their psychological treatment; they were able to think about the event without being overwhelmed by emotions. Potential respondents were offered easy access to additional psychological interventions, independent of research participation. We called all teachers whose pupils had been in our general population study (Chapters 2 and 3) as well the parents of the children in the interview study (Chapter 6) shortly after participation as well as one month later. The teachers reported no concerns about their pupils due to the questionnaire study. One family in the interview study felt that a new appointment with the psychologist would be helpful but did not regret participation. Overall, negative effects caused by the data collection were not found.

Empirical data on the effects of trauma research participation are slowly accumulating. In adults, participants' judgments of the balance between the costs and benefits of participation generally turned out to favor benefits, even for the minority who reported experiencing distress during the research.[30] For children, Kassam-Adams and Newman[24] reported that participation in a research interview following traumatic injury carried little risk of generating distress. Only 5% of the children reported being upset or sad. In contrast, 77% felt good about helping others by taking part in the study.

This is not to say that all intended trauma research should be conducted without hesitation. Each new project should be carefully considered and all possible measures should be taken to make sure that children feel in control. In addition, we propose to study the

reactions of children and parents to research participation more systematically. The Reactions to Research Participation Questionnaires (RRPQ-C and RRPQ-P)[31,32] may be helpful in this respect. These brief instruments cover four domains: the child's or parent's positive appraisals of research participation, negative appraisals of research participation, assessment of informed consent and trust in the research team, and understanding of his/her rights as a research participant. The application of these measures would enable the evaluation of pilot research studies and their subsequent improvement, as well as the creation of a knowledge base on trauma research participation experiences in order to further inform researchers and institutional review boards.

The highly debated definition of traumatic exposure

Many scientists and clinicians use the following definition of traumatic exposure, which consists of two elements: "The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others (criterion A1) and the person's response

More about ethics: parents' views on giving consent for trauma research (Alisic, Oskam, & Kleber, 2009)[33]

In an exploratory mixed methods study, we examined parents' views on the participation of their children in trauma research. Based on the quantitative analysis of the informed consent forms used in the study in the normal population, and the remarks on them (Chapters 2 and 3), we carried out semi-structured interviews with 14 parents who were not approached for the general population study. We asked them about their children's potential participation in trauma research. Parents showed a positive attitude towards participation, even when the children had been exposed to trauma. The main reason for consent was to support knowledge development, leading to better psychological interventions for children. However, parents wanted to have extensive information about the study (e.g., access to sample questions and information about exact procedures) and parents of younger children (aged under 10) worried that the children would not be able to understand questions well enough to be reliable respondents (in line with the quantitative results). Many parents wanted to discuss their questions with a researcher before deciding upon consent. Our preliminary recommendations were to inform parents extensively about the goals, content, and procedures of the study; to pay special attention to showing the feasibility of the study to parents with young children; and to provide parents with truly easy access to the researchers involved (e.g., physical presence at school to answer questions in the weeks prior to data collection, in addition to providing email addresses or phone numbers).

involved intense fear, helplessness, or horror. In children, this may be expressed instead by disorganized or agitated behavior (criterion A2)" (American Psychiatric Association[1], p. 467). Although it may look like a clear concept at first sight, it is highly debated, especially with the new edition of the DSM (the DSM-5) being prepared. While some prefer the definition to remain the same for consistency purposes, others propose the deletion of the A2 criterion and/or a reformulation of the A1 criterion.[34,35]

As of January 2011, the 'objective' A1 criterion is likely to be reframed.[36] One would expect that in a population of children or adults, those confronted with a traumatic event would have a higher chance of suffering from PTSD symptoms later on than those who were not confronted with a traumatic event. In our population study (Chapter 3) we found this to be the case. However, the effect was small, which might allow the question of whether the definition of trauma should not be made more strict. This appears to be in line with the new proposal in which the phrase "being confronted with" has been clarified (e.g., when learning about an event that occurred to a close relative or close friend, the actual or threatened death must have been violent or accidental). The rationale for the rewording is that it makes "a better distinction between 'traumatic' events and events that are distressing but which do not exceed the traumatic threshold".[36]

Another change proposed for DSM-5 regards the 'subjective' A2 criterion. In the present dissertation, we did not apply criterion A2 because we thought that reports of this criterion would be influenced by symptoms at the time of the study. Children who have developed stress symptoms after trauma probably have a greater chance of recalling their anxiety during exposure than children who have not developed stress symptoms (cf. McNally[37] for adults). Our decision turns out to be in line with the current proposal to delete criterion A2 from DSM-5. Recent studies found that this criterion did not differentiate enough between people suffering from posttraumatic stress disorder and people who did not suffer from the disorder to justify maintaining it.[38]

Finally, the fact that the definition of trauma incorporates a large variety of experiences has been questioned.[39] For example, both single rape and chronic childhood abuse have been studied as similar types of traumatic exposure. This is not without reason since there are important similarities: after both types of events children show symptoms of PTSD.[40] However, one might expect that 'complex trauma' – the chronic, interpersonal type of exposure – relates to more complex consequences for development. Children who have been exposed to a larger accumulation of trauma show more self-regulatory problems than children who have been exposed to less complex trauma.[39] Many authors refer to the distinction between Type I (acute) and Type II (chronic) trauma.[41] In most parts of the dissertation we have included both Type I and Type II experiences in order to study commonalities. In addition, the qualitative study in children (Chapter 6) showed that trauma was almost never truly a 'single incident': many children suffered from a long

aftermath. However, our impression is that samples of children with Type II experiences often differ in several respects from samples of children with Type I experiences (e.g., in the meta-analysis, we excluded most samples with Type II experiences because these were part of intervention studies and the measurement of predictors started more than three months after the end of the trauma), which precludes firm conclusions about similarities and differences. More research will be needed to decide upon the use of one or more categories of trauma, as comparisons based on current information are unfeasible.

Balancing the focus on PTSD symptoms

In addition to the definition of traumatic exposure, the symptom criteria of Posttraumatic Stress Disorder (PTSD) are also subject to a vigorous debate. Without repeating the criticisms of PTSD that were described in Chapters 3 and 4, three points are important to discuss. First, it appears that the DSM-5 criteria for children will again be derived from the

Very complex trauma: Fatal domestic violence (Alisic, Van Schaijk, Groot, & Strijker, in progress)[42]

Children who survive fatal domestic partner violence lose both their parents and their home at once: one parent is killed, the other parent is detained (or sometimes commits suicide), and it is impossible for the children to stay at home because there are no caregivers and/or the home is sealed for forensic examination. We examined the cases of children whose biological father killed their biological mother, or vice versa, and who had been referred to the Psychotrauma Center for Children and Youth (N = 25 families, concerning 38 children). Two researchers coded event characteristics, child characteristics, and mental health care advice from clinical assessment reports. It took an average of about one year for children to be referred to the center. The majority of the children (84%) had been confronted with the death of their mother caused by their father. Only a few children (17%) were clearly not present at the time of the killing. Therefore, many children had possibly seen or heard the death of their parent. Often, there was a history of domestic violence. The children showed a variety of posttraumatic reactions, including severe sleeping problems, reexperiencing the event, feelings of guilt, feeling unsafe, posttraumatic play, behavior problems, and emotional numbing. For example, a boy showed feelings of guilt by saying several times that he really had tried to scream as loud as possible to wake up the neighbors. Another child engaged in posttraumatic play, continually making cutting movements on her puppets. The findings point to the seriousness of symptoms in children who have been confronted with fatal domestic violence.

criteria for adults. To cite the DSM-5 workgroup progress report: "Child and Adolescent PTSD: New criteria for PTSD in adults may emerge. These will need to be applied to studies in youth."[43] Although the workgroup intended to convey the idea that adult criteria should not be applied to children without testing the applicability, this quote clearly indicates its line of reasoning, that what applies to adults may apply to children. That could be true, but why not start from the child's point of view? As Salmon and Bryant[44] and Scheeringa and colleagues[45] indicated, differences exist between children and adults with regard to cognitive and emotional processing. We would strongly advocate a child-oriented approach. The qualitative study in the present project (Chapter 6) is an example of a purely child-oriented approach: the themes important to children emerged from the semi-structured interviews. After such an explorative phase, experiments and population studies can be carried out to test specific hypotheses regarding relationships and processes. For example, following from the results of the qualitative study, it would be valuable to test relationships between children's repertoires of coping styles and subsequent posttraumatic stress or resilience trajectories.

Second, there is a debate about the exact numbers of PTSD criteria necessary for children to be given the PTSD diagnosis. Although in this case it is valuable that differential approaches to adults and children have been proposed, the debate may miss a point. Shouldn't we pay much more attention to 'impairment' in daily life instead of numbers of symptoms in numbers of clusters? In questionnaire studies, impairment is rarely studied. Our project is an exception in measuring children's quality of life. In child disability research, children's level of functioning takes a much more prominent place in assessment. For example, the International Classification of Functioning, Disability and Health Children and Youth Version (ICF-CY)[46] assesses several health and health-related domains. These domains are classified into bodily, individual and societal perspectives by means of two lists: a list of body functions and structures, and a list of domains of activity and participation. Participation in normal life is rarely studied in child traumatic stress but appears to be a valuable point of interest.

Third, for most children the debate on the exact numbers of PTSD symptoms required for diagnosis could be bluntly seen as a waste of effort: they do not develop the disorder (although we still do not have strong estimates of PTSD rates after exposure; the only highly cited meta-analysis in this regard has not been published in a peer-reviewed journal). Therefore, in the present project we have not only studied the negative side of trauma (risk factors and stress symptoms), but also the positive side (protective factors and positive experiences). In our view, positive aspects are important in the processes that take place after trauma, and are an essential basis for the 'empowerment' of children.[cf. 6] This matches the wellness orientation described by Friedman et al.[47] The focus on negative aspects and vulnerability is dominant: a quick search in PILOTS – a

trauma literature database – yields 60 peer-reviewed articles about "children" AND "risk factor" against 11 about "children" AND "protective factor" (January 1980 - December 2010). As with PTSD, definitions of constructs regarding the positive sides of trauma, such as posttraumatic growth and resilience, are not crystal clear. However, the present dissertation shows that children in the higher classes of elementary school report at least some positive experiences and helping factors (Chapter 6) and that posttraumatic growth and posttraumatic stress can co-exist (Chapter 3), justifying the continuation of this line of research.

Input to child trauma theory

The themes that have been examined in this dissertation project - especially exposure rates in the Netherlands, children's experiences of posttraumatic growth, their posttrauma coping styles, and their views on recovery, as well as the perspectives of

A potential protective factor: parental emotion coaching (Ellis & Alisic, submitted)[48]

This preliminary report on a research project at Harvard Medical School/Children's Hospital Boston in collaboration with the Oregon Social Learning Center (United States) focused on parental emotion coaching. The way parents talk to their children about emotions is related to children's regulation. This may be particularly favorable when parents are adept at emotion-coaching skills.[49,50] Parents who engage in emotion coaching typically respond to a child's emotions by acknowledging and validating their child's emotions, and by offering guidance on how to manage intense or negative feelings. If parental emotion coaching is found to buffer the effect of trauma on children's emotional regulation, then this could be an important protective factor to address in prevention and intervention programs. However, in the child trauma field studies on this topic are scarce,[51] and often restricted to questionnaires and interviews *about* coaching behavior and children's responses[e.g., 50] rather than actual behavior observations. In the present study, actual behavior is measured. Maternal emotion coaching of a child when discussing a negative event and child emotion regulation during a separate disappointment task in a small sample of 15 children who had been referred to maltreatment services were coded by blind, independent raters. The relationship between maternal emotion coaching and child emotion regulation was strong (r = .70). Although based on a very small sample in a specific context, the present findings suggest that working on parents' emotion coaching skills might be an important factor in children's adjustment to trauma.

parents and teachers - have rarely, if ever, been studied before. Our findings lead to a number of proposals to adjust theories. Examples regard our suggestions to focus on proximal (e.g., psychological symptoms, social support) instead of distal (e.g., demographic) factors in general risk factor models[14,52] (see Chapter 5) and to include the notion of minimal learning (i.e. conserving one's self-image in the face of adversity)[19] in theories on shattered assumptions in children (see Chapter 6). In Chapter 7 we proposed the extension of the model of Relational PTSD[17] to the model of Relational PTSD and Recovery. Scheeringa and Zeanah[17] described three pathological parenting styles: the withdrawn, the overprotective, and the frightening parent. Although this model is comprehensive in its description of pathological interactions, we suggested adding a healthy pattern, based on the idea that most children recover well from their exposure to severe stressors and that it is important to examine supportive parental practices. We described 14 strategies that parents reported using to become aware of their child's needs and to act upon these needs, the two main elements of responsive parenting after trauma that we distinguished.

In addition, the dissertation provided evidence supportive of current theories and theoretical notions. For example, we confirmed the co-existence of posttraumatic stress and posttraumatic growth in children (see Chapter 2). We also found support for the hypothesis that stress hormones play a part in fear conditioning and the overconsolidation of trauma memories;[15] increased heart rate was found to predict stress symptoms (see Chapter 5). Furthermore, in Chapter 6 a categorization of coping behaviors in children after trauma emerged, which had many similarities with the factor analytic model of Ayers et al.[20] in a non-trauma population, after which we formulated the hypothesis that children with a larger repertoire of different coping behaviors will better recover after exposure to trauma.

A basic premise of this project was that children are different from adults, suggesting a need for child trauma theory. Descriptions of differences between children and adults have been provided by Salmon & Bryant[44] for specific trauma-related processes, and more general processes have been described by developmental psychology theories.[53] Also, recently the argument that children are not just little adults has arisen in (psycho) pharmacology.[e.g., 54] Children not only differ from adults in 'quantity' (scale) but also in 'quality'. Although the children in our samples showed similarities with adults (e.g., they reported several intrusion and avoidance symptoms in line with adults), our findings indeed pointed to differences, most notably the importance of parents and cuddly toys in children's world of recovery.

Contributing to child trauma theory: A Bayesian approach (Van Wesel, Boeije, & Alisic, submitted)[55]

In this study from Utrecht University and the Psychotrauma Center for Children and Youth we used three sources to examine which factors influence the development of posttraumatic stress in children. The sources were the meta-analysis of this dissertation, a meta-synthesis, and expert elicitation. The meta-analysis is described in Chapter 5. In the meta-synthesis, we coded and combined the findings from 17 qualitative papers on children's reactions to trauma.[56] In addition, six child trauma experts were interviewed about their ideas on factors that influence children's posttraumatic reactions. We found that some parts of the hypotheses put forward by the three sources overlapped while other parts were source-unique. Children's feelings and the interactions they have with their parents turned out to be influential factors in the total base of research, while duration of hospitalization (meta-analysis), normalcy (meta-synthesis), and safety (expert elicitation) were source-unique. The sources also attached different importance to several factors. To gain more specific insights, we proposed three alternative overall hypotheses and a statistical approach to weighing the evidence of the different sources in a future study. The present study shows the importance of not relying solely on one type of research (e.g., quantitative or qualitative studies) because each type has its preferred themes and concepts.

Building child trauma theory

Nothing is as practical as good theory.[57] For adults who have been exposed to severe stressors, Cahill and Foa[58] described what a good theory should look like: it predicts why someone develops PTSD and someone else does not, and it explains why cognitive behavior therapy is an effective intervention. We would propose a slightly different formulation for children, more in line with the wellness approach[47]: good theory differentiates between pathways to long-term stress reactions or to resilience, is child-specific with a clear eye for developmental issues, and explains why interventions that have been proven effective take effect.

In order to build good theory and improve current conceptualizations, we feel several topics are of interest for future research. One cross-cutting topic concerns the study of behavior. The present study, like most studies, has relied on self-report measures and interviews. However, these instruments measure intentions and feelings, not actual behavior. We propose adding observation research. This will give important clues about what actually happens in addition to information about thoughts and feelings. For example, the interactions between parents and children at home would be of great

importance to developing our views on parental responsivity. Classroom interactions between teachers and children, or between children and their peers after trauma, will add to the understanding of children's relationships with significant others and the impact on recovery. Observation research may also be very specific. For example, we are currently investigating the interaction patterns between the interviewer and the children of Chapter 6 into detail to learn about communication about trauma.[59] Observation research may also extend our understanding of coping, resilience and posttraumatic growth: what do children who recover well actually do? Which behaviors are associated with the experience of posttraumatic growth?

In addition to specific methodology and specific research questions, child trauma theory building could be facilitated in three general areas (described in Chapter 5): publication policy, methodology, and collaboration. Journal policies could encourage the building of theory, for example by asking authors to provide a bullet point addressing 'how this study builds theory'. Also, more (comparable) longitudinal research is needed in order to synthesize research findings. In particular, children in non-hospital settings should be studied, as well as variables that are not easy to measure (e.g., social support instead of demographic variables). Finally, child trauma theory would benefit from more thorough collaboration between scholars. For example, we will need to develop or adapt measures to match the new DSM-5 criteria. It would be valuable to develop a limited number of strong measures that many people can use. Working together more intensively and sharing more data and initiatives would speed up the process of uncovering the world of children.

Clinical implications and practical outcomes

This research project reveals several themes that appear to be important to children, and deserve a more central place in clinical work. For example, social support was prominent in children's narratives. Currently, we do not have specific and in-depth guidelines regarding assessing and building social support for children. Also, parental distress turned out to be a significant predictor of children's posttraumatic stress. Although parents are often included in the treatment and it is generally accepted that this is important, knowledge about parental roles in recovery is lacking.[21,60] The findings about parental responsivity (distinguishing several parental approaches to becoming aware of and acting upon children's needs) provide a structure for discussing parents' strategies to help a child. Similarly, our categorization of coping behaviors in children offers starting points for discussing how a child deals with his or her experience. In general, the dissertation shows the importance of a child- and family-centered approach.[61] Even though the idea is already being welcomed by many clinicians, current standards in the Netherlands can still be taken a step further (e.g., providing child care when parents have treatment sessions is not a standard service).

This dissertation project has yielded several concrete 'products' for future research and clinical practice. First, it has led to the development (or translation) and refinement of a number of Dutch measures, notably the Dutch version of the Posttraumatic Growth Inventory for Children[62] (original English version by Kilmer et al.[63]), the Children's Responses to Trauma Inventory (child and parent version),[64] the Dutch version of the Reactions to Research Participation Questionnaires[32] (child and parent version; original English edition by Kassam-Adams & Newman[31]), and the PTSD Inventory for Children[65] (a clinical interview; original English version by Saigh[66]).

Another type of product is the Toolkit Child and Trauma.[67] Based on the research findings of the dissertation as well as on national and international literature, this toolkit (a booklet and the website www.kind-en-trauma.nl) provides teachers in elementary schools with background information about trauma and posttraumatic reactions in children in the Netherlands, case examples, simple strategies to assist children and to take care of oneself, and information about mental health care providers. All elementary schools in the Netherlands as well as all students in teacher-training classes (final year) have received the toolkit.

GENERAL CONCLUSION

This dissertation focused on exposure to and recovery from trauma in children. Even though the number is small compared to many US statistics, a substantial number of elementary school children (aged 8-12 years) in the Netherlands is confronted with severe stressors. Children may experience not only posttraumatic stress symptoms after exposure, but also a negative impact on broader areas of their life. Concurrent with negative psychological sequelae, they report positive reactions such as posttraumatic growth. Most of the children recover well in the end. The children who continue to have serious symptoms have higher levels of stress, anxiety, or depression, or their parents showed more distress shortly after the event. Therefore, the rare theoretical models with regard to child trauma should prefer proximal predictive factors of posttraumatic stress over distal factors. Furthermore, a wellness approach would be valuable in addition to the pathology-oriented models. Children in the last four years of elementary school are well able to report on their recovery from severe stressors and the issues they bring up (e.g., secondary stressors, social support, coping behaviors) need to be incorporated explicitly in trauma-informed care. Parents experience a challenge to act responsively to their child after trauma, and their practices need to be taken into account more methodically. Teachers, who are 'significant others' for children, struggle with their role in assisting children after severe stressors, and deserve more support.

Future research needs to include the study of trauma research participation, behavioral observations, and the factors that empower children who are confronted with trauma.

This dissertation proposed the model of Relational PTSD and Recovery, a categorization of coping behaviors in children, and an overview of responsive parenting strategies. It confirmed the interest in the notion of minimal learning and in biological models of stress. In addition, it underlined the importance of publication policies, methodology, and collaboration to further the field of child trauma theory. It is hoped that this dissertation will lead to more theory building and ultimately, to initiatives that are helpful to children. Child trauma research is a young field with lots of discoveries to make and steps to take, one in which a focus on adapting to the world of children deserves a central place.

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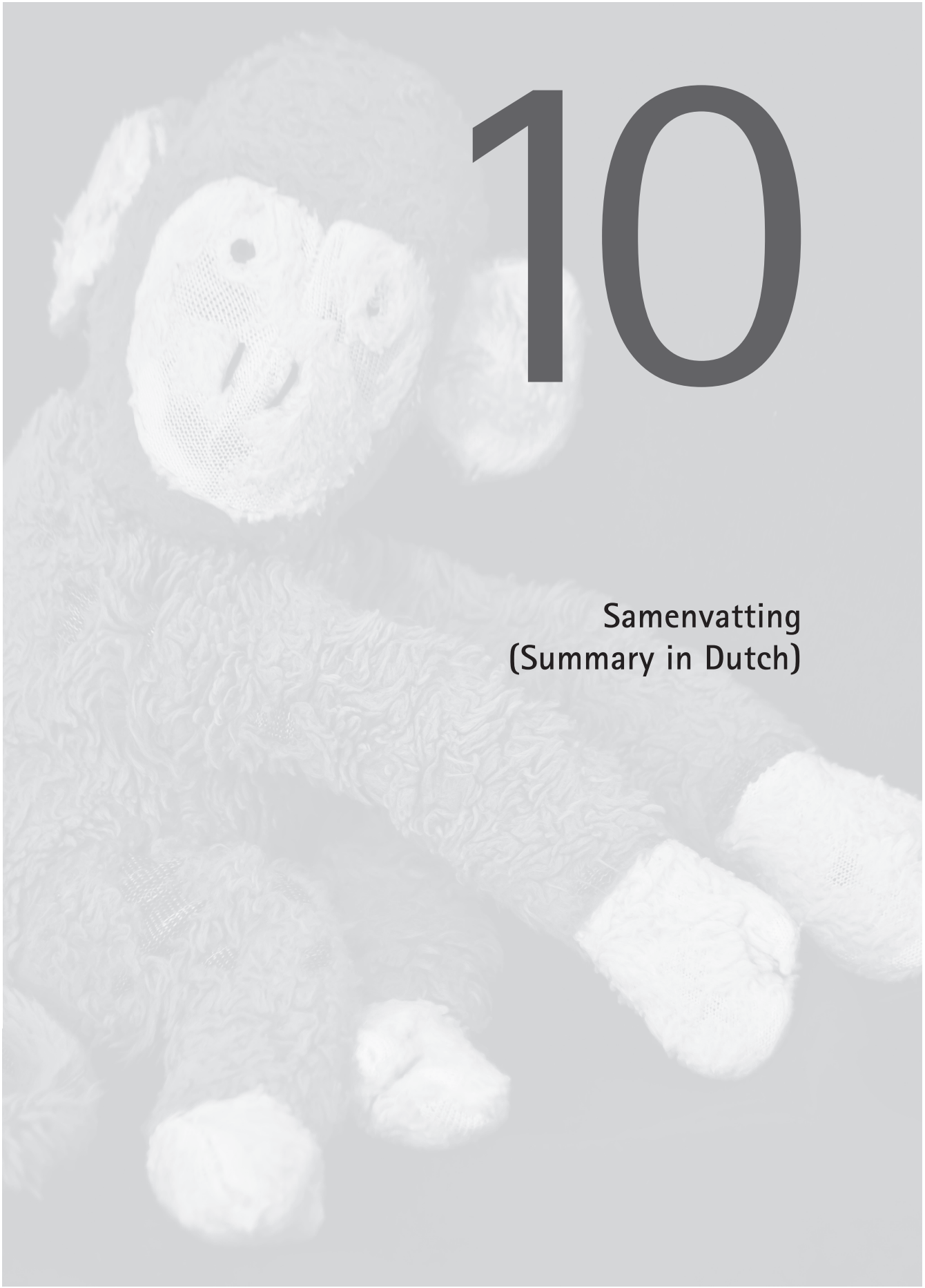

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Samenvatting (Summary in Dutch)

Dit proefschrift is gericht op het thema *kinderen en trauma*, met specifieke aandacht voor blootstelling aan en herstel van schokkende gebeurtenissen.[1] In het kort waren de argumenten om het onderzoek uit te voeren gebaseerd op a) indicaties dat veel kinderen geconfronteerd worden met schokkende gebeurtenissen, b) bevindingen dat trauma ernstige en langdurige consequenties kan hebben bij kinderen, c) de visie dat er in het traumaveld naar meer dan alleen de Posttraumatische Stress Stoornis (PTSS) gekeken moet worden, d) de identificatie van enkele gaten in de huidige kennis die ingevuld moeten worden om beter aansluitende hulpverlening te kunnen bieden. Er is weinig theorie op het gebied van kinderen en trauma. Het doel van dit proefschrift was om theorieontwikkeling en het ontwerp van preventie- en interventieactiviteiten te faciliteren via een breed overzicht van het thema. Het project omarmde verschillende methoden en gezichtspunten, en richtte zich in het bijzonder op kinderen in de bovenbouw van de basisschool (groep 5 t/m 8). Deze samenvatting bespreekt de belangrijkste bevindingen en conclusies van het onderzoek.

Blootstelling aan trauma en welzijn in de normale populatie

Om preventieactiviteiten te kunnen sturen is het nodig om te weten hoeveel kinderen geconfronteerd worden met schokkende gebeurtenissen en welke kinderen meer risico op blootstelling lopen dan andere. De prevalentie van trauma bij kinderen in Nederland was onbekend en de weinige studies die uitgevoerd zijn om de samenhang met demografische (risico)factoren te meten, lieten tegenstrijdige resultaten zien. In hoofdstuk 2 hebben we de prevalentie van trauma en de samenhang met leeftijd, sekse, etniciteit en woonomgeving (stedelijk versus landelijk) onderzocht. In de steekproef van 1.770 basisschoolkinderen (groep 5 t/m 8) uit de normale populatie rapporteerde 14% van de respondenten een schokkende gebeurtenis. De meest frequent genoemde ervaring was het plotselinge overlijden of de ernstige verwonding van een dierbare. De gevonden totale prevalentie was vrij laag in vergelijking met Amerikaanse studies[bijv. 2] en sloot meer aan bij de bevindingen van een Duitse studie.[3] Dit ondersteunt de hypothese van Frans et al. dat er een "cross-Atlantisch verschil" is, met hogere blootstellingspercentages in de VS dan in Europa.[4] Niettemin correspondeert 14% met ongeveer vier kinderen in een gemiddelde Nederlandse klas, een aanzienlijk aantal. Sekse, etniciteit en woonomgeving kwamen niet naar voren als significante risicofactoren. Kinderen in landelijke gebieden en kinderen met een autochtone achtergrond zijn dus niet gevrijwaard van blootstelling aan schokkende gebeurtenissen in Nederland. Dit lijkt samen te vallen met het niet-gewelddadige karakter van de meeste gerapporteerde gebeurtenissen. In eerdere artikelen werden de verschillen vooral gesignaleerd bij blootstelling aan geweld.[bijv. 5] Leeftijd was significant en positief

[1] De woorden 'schokkende gebeurtenis', 'trauma', 'traumatische gebeurtenis' en 'traumatische ervaring' worden uitwisselbaar gebruikt. Bij alle doelen we op gebeurtenissen die voldoen aan het A1 criterium voor PTSS van de DSM-IV.[1]

gerelateerd aan blootstelling. Een verklaring is dat oudere kinderen simpelweg meer tijd hebben gehad om iets mee te maken maar het is ook mogelijk dat zij kwetsbaarder zijn vanwege de toename in hun autonomie (bijvoorbeeld zelfstandig naar school gaan).

In hoofdstuk 3 hebben we onderzocht in hoeverre posttraumatische stressreacties (het brede scala aan symptomen die kinderen kunnen vertonen na confrontatie met een schokkende gebeurtenis), posttraumatische groei (het ervaren van persoonlijke groei als uitkomst van het verwerken van een ernstige levensgebeurtenis) en kwaliteit van leven (algemeen welzijn in het dagelijks leven) met elkaar en met blootstelling aan schokkende gebeurtenissen samenhangen. Deze psychosociale constructen leken relevant in de literatuur.[bijv. 6-8] maar de onderlinge verbanden en de relatie met trauma in een steekproef van kinderen uit de normale populatie was niet of nauwelijks onderzocht. Posttraumatische stressreacties bleken in onze steekproef (zie hoofdstuk 2) in positieve zin samen te hangen met posttraumatische groei. We trokken de conclusie dat negatieve en positieve psychische gevolgen van trauma bij kinderen niet gezien moeten worden als tegenpolen maar eerder als reacties die naast elkaar kunnen bestaan. Posttraumatische stress en kwaliteit van leven waren negatief aan elkaar gerelateerd. Onze resultaten suggereren dat de consequenties van schokkende gebeurtenissen bij kinderen in de basisschoolleeftijd verder reiken dan alleen specifieke symptomen en invloed hebben op meer algemene aspecten van het leven. Posttraumatische groei en kwaliteit van leven waren positief gecorreleerd wanneer er voor posttraumatische stress gecontroleerd werd en negatief wanneer dat niet werd gedaan. Dit bevestigde een positieve relatie maar gaf ook aan dat de aanwezigheid van posttraumatische stressreacties de richting van de relatie overschaduwt. Kinderen die geconfronteerd waren met een schokkende gebeurtenis rapporteerden meer posttraumatische stress, meer posttraumatische groei en minder kwaliteit van leven dan kinderen die niet waren geconfronteerd met trauma. De verschillen waren significant maar klein, mogelijk doordat kinderen meestal veerkrachtig reageren op moeilijke omstandigheden[2] of doordat mediërende en modererende variabelen (bijvoorbeeld de subjectieve beleving van de gebeurtenis en het gedrag van ouders) een rol spelen.[9]

Het meten van posttraumatische stressreacties

In hoofdstuk 4 hebben we de ontwikkeling en validering van de Schokverwerkingslijst voor Kinderen (SVLK) gepresenteerd. De SVLK is een kindvriendelijke zelfbeoordelingslijst voor posttraumatische stressreacties en meet daarbij de brede range aan symptomen die bij kinderen gezien worden na schokkende gebeurtenissen (PTSS symptomen maar ook andere kindspecifieke reacties zoals regressief gedrag en separatieangst[7]). We hebben eerst de betrouwbaarheid en validiteit van de originele SVLK[10] gemeten via een secundaire data-analyse van vier klinische en niet-klinische steekproeven ($N = 96$) en via beoordelingen van experts. De totale schaal was betrouwbaar en vertoonde convergente en discriminante

validiteit ten opzichte van schalen voor respectievelijk internaliserend en externaliserend gedrag. Er was echter ook ruimte voor verbetering. De subschaal voor vermijding had een relatief lage betrouwbaarheid, de formulering van enkele items was te ingewikkeld voor kinderen, en een aantal PTSS symptomen ontbrak. Na revisie vertoonde de SVLK een goede tot uitstekende betrouwbaarheid bij de 243 kinderen die een schokkende gebeurtenis hadden gerapporteerd in de studie van hoofdstuk 2. De convergente validiteit met een ander instrument voor posttraumatische stress en met een schaal voor psychisch welzijn werd bevestigd. Hoewel we de resultaten gezien de beperkte leeftijdsrange van de steekproef en het gebruik van zelfbeoordelingslijsten als 'voorlopig' typeerden, concludeerden we dat de SVLK een veelbelovend kindgeoriënteerd instrument is.

Gebruik en validering van theorie in longitudinale studies

Het doel van hoofdstuk 5 was het faciliteren van theorievorming met betrekking tot de ontwikkeling van posttraumatische stress bij kinderen. Daarvoor concentreerden we ons enerzijds op (gaten in) theoriegebruik en anderzijds op het samenvatten van bewijs voor die theorieën (met betrekking tot risico- en beschermingsfactoren voor posttraumatische stress) in longitudinale studies. Theoriegebruik was nog niet systematisch onder de loep genomen en de twee eerder uitgevoerde meta-analyses naar predictoren van posttraumatische stress bij kinderen[11,12] kenden beperkingen (onder andere de inclusie van cross-sectionele gegevens die kunnen vertekenen en de focus op ziekte en letsel in plaats van alle typen schokkende gebeurtenissen). In de literatuur van de afgelopen 30 jaar vonden we 40 studies die predictoren (gemeten binnen drie maanden na een schokkende gebeurtenis) van posttraumatische stress (gemeten op of na drie maanden na de schokkende gebeurtenis) maten bij kinderen. Expliciete theoretische onderbouwing was slechts in een minderheid van de studies aanwezig, in lijn met Toracco's indruk dat niet-theoretisch onderzoek dominant is in de wetenschap.[13] Als er expliciet gerefereerd werd aan een theorie betrof dit meestal een algemeen model van risicofactoren,[bijv. 14] een biologische theorie,[bijv. 15] of een cognitief model.[bijv. 16] De belangrijkste predictoren van 'lange-termijn' posttraumatische stress bij kinderen waren symptomen van acute posttraumatische stress (gemeten 0-1 maand na de gebeurtenis) en korte-termijn posttraumatische stress (gemeten 1-3 maanden na de gebeurtenis), depressie, angst, en posttraumatische stress van ouders. Sekse (meisjes meer dan jongens), de ernst van de verwonding, de duur van het ziekenhuisverblijf en hartslag kort na opname in het ziekenhuis lieten kleine effecten zien. Leeftijd, minderheidsstatus en sociaal-economische status hingen niet significant samen met lange-termijn posttraumatische stressreacties bij kinderen. Omdat veel andere variabelen niet vaak genoeg onderzocht waren om ze samen te vatten, konden bestaande theorieën slechts gedeeltelijk bevestigd of verworpen worden. Vooral beschermende factoren bleken nog onderbelicht. Onze bevindingen suggereren dat bepaalde demografische variabelen van kinderen (leeftijd,

minderheidsstatus, sociaal-economische status) verwijderd kunnen worden als directe risicofactoren terwijl modellen voor angstconditionering[15] voorlopig bevestigd werden. Een belangrijke bevinding betrof de predictieve waarde van ouderlijke stress. Scheeringa en Zeanah[17] hebben een model ontwikkeld voor 'Relationele PTSS' waarin zij drie stijlen beschrijven waarmee ouders met stressklachten de symptomen van zeer jonge kinderen verergeren; de teruggetrokken ouder, de overbeschermende ouder en de beangstigende ouder. Onze resultaten geven aanleiding om dit model verder te onderzoeken bij kinderen in alle leeftijdsgroepen.

Beleving van trauma en herstel: kinderen, ouders en leerkrachten

Om het herstel van kinderen na schokkende gebeurtenissen uitvoeriger te begrijpen dan alleen in "maten en cijfers"[18] is het zinvol om kwantitatieve resultaten aan te vullen met rijk kwalitatief onderzoek. Het doel van hoofdstuk 6 was om de beleving die kinderen hebben van het herstelproces na eenmalig trauma te exploreren. Tot nu toe waren kwalitatieve, kindgeoriënteerde studies schaars en zeer specifiek (bijvoorbeeld gericht op één type gebeurtenis of één type uitkomst, of gebaseerd op kleine groepen). Uit onze interviews met 25 kinderen die zeer verschillende gebeurtenissen hadden meegemaakt, kwamen verschillende thema's naar voren. De kinderen vertelden over de lange nasleep met nieuwe stressoren, een verstoord wereldbeeld en stressklachten. Deze bevindingen sluiten aan bij een nieuwe theorie over 'minimaal leren' die uitlegt dat kinderen hun zelfbeeld zo lang mogelijk intact proberen te houden bij ernstige gebeurtenissen, bijvoorbeeld door hun eigen handelen extern te attribueren.[19] In het algemeen beleefden de kinderen een herstel dat stap voor stap verliep en, hoewel slechts een paar ervaringen van posttraumatische groei expliciet genoemd werden, identificeerden zij vaak positieve elementen binnen de negatieve ervaring. Ze praatten veel en spontaan over de steun die ze ontvingen van vrienden, ouders en hun knuffels. Terwijl sociale steun een onderbelicht onderwerp is in traumaonderzoek bij kinderen (zie ook hoofdstuk 5), laten onze resultaten zien dat het meer onderzoeks- en klinische aandacht verdient. De kinderen vertoonden een brede range aan gedragingen om de schokkende ervaringen te hanteren. We deelden ze in in vier categorieën: focussen op het normale en het positieve, ontwijken van risico's en reminders, actief verwerken van het trauma, en zoeken van steun. Deze indeling komt dicht in de buurt van de resultaten van een factoranalyse in een steekproef van kinderen uit de normale populatie[20] en moet verder onderzocht en daarna toegepast worden bij kinderen die geconfronteerd zijn met trauma.

Het doel van hoofdstuk 7 was om licht te werpen op de manier waarop ouders het herstel van hun kind na een schokkende gebeurtenis beleven en beïnvloeden. Uit de meta-analyse in hoofdstuk 5 kwam naar voren dat stressklachten van ouders significant bijdragen aan de voorspelling van lange-termijn stressklachten van kinderen. Tegelijkertijd bleken die interacties tussen ouders en kinderen na trauma, en in het bijzonder de positieve,

ondersteunende varianten, verwaarloosd te worden in onderzoek.[21] Het perspectief van ouders op het herstel van hun kind was nog nooit systematisch onderzocht bij een brede range aan schokkende gebeurtenissen. Onze interviews met 33 ouders (van 25 kinderen; zie hoofdstuk 6) leverden het thema 'responsief ouderschap' op als centraal element in het herstel van kinderen. Responsief ouderschap bestond uit a) bewust zijn van de behoeften van het kind en b) actie ondernemen om in die behoeften te voorzien. We hebben 14 strategieën van responsief ouderschap onderscheiden, zoals het vergelijken van gedrag tussen het kind en een broertje of zusje en het creëren van een situatie waarin een kind kan praten over de ervaring als het wil. Kenmerkend voor de responsieve gedragingen waren de pogingen van ouders om het hersteltempo van hun kind te volgen terwijl ze structuur en sturing aanboden waar dat nodig was, of hulp zochten om dit te doen. Deze resultaten bieden een niet-pathologische aanvulling ('de responsieve ouder') op voor Scheeringa en Zeanah's model van Relationele PTSS[17] (het model zou dan Relationele PTSS en Verwerking kunnen heten). Daarnaast gaven ouders aan dat hun vermogen om responsief te zijn beïnvloed werd door hun eigen mate van stress, wat in overeenstemming is met hetzelfde model en met de resultaten van onze meta-analyse.

Hoofdstuk 8 behandelde het perspectief van leerkrachten op het ondersteunen van kinderen die een schokkende gebeurtenis hebben meegemaakt. Hoewel een aanzienlijk aantal kinderen geconfronteerd wordt met trauma (zie hoofdstuk 2) en leerkrachten een belangrijke rol in het leven van kinderen spelen,[bijv. 22] was er nog geen inzicht in de visie die leerkrachten op het thema hebben. We hebben een 'mixed methods' studie uitgevoerd bij leerkrachten van groep 5 t/m 8 van de basisschool, met een kwalitatief onderdeel (exploratieve diepte-interviews met 21 leerkrachten) en een kwantitatief onderdeel (een vragenlijststudie bij 765 leerkrachten in heel Nederland, gebaseerd op de resultaten van de interviews). De belangrijkste bevinding was dat veel leraren worstelen met hun rol wat betreft het ondersteunen van kinderen na trauma. Ze zochten naar een balans tussen aandacht geven aan de behoeften van een kind dat een schokkende gebeurtenis heeft meegemaakt en lesgeven aan de andere kinderen in de klas, en tussen ondersteuning bieden en hun eigen welzijn bewaken. Ze ervaarden een gebrek aan kennis en vaardigheden. Een van de dilemma's van de leerkrachten (hoe de missie van onderwijs in balans te brengen met de noodzaak om leerlingen te helpen bij het verwerken van trauma) was al geconstateerd op schoolniveau[23] maar nog niet op het niveau van de individuele leerkracht. Daarnaast hebben we de samenhang bekeken tussen de worsteling van leerkrachten (geoperationaliseerd als de som van de negen dilemma's en onzekerheden die zij rapporteerden) enerzijds en ervaring, training en sekse anderzijds. Sekse speelde geen rol van betekenis maar algemene onderwijservaring, specifieke ervaring met getraumatiseerde kinderen en training op dit gebied wel, hoewel het om een klein effect ging. We raadden aan om leerkrachten beter te ondersteunen door duidelijk beleid op dit vlak, training en betere informatievoorziening.

In hoofdstuk 9 werden naast een algemene samenvatting ook enkele terugkerende thema's besproken. Allereerst keken we naar de ethische vragen rond traumaonderzoek bij kinderen. In onze ogen is dit onderzoek nodig en kan het goed uitgevoerd worden, maar moeten de onderzoekservaringen van kinderen en ouders systematisch gemeten worden. Ook bespraken we het debat over de definitie van een traumatische gebeurtenis. Waarschijnlijk wordt in de DSM-5 een strakkere definitie van het A1 criterium gehanteerd en wordt het A2 criterium verwijderd.[24] Dit lijkt goed aan te sluiten bij onze keuzes in het onderzoeksproces, hoewel de waarde van het onderscheid tussen type I (acuut) en type II (chronisch) trauma meer onderzoek behoeft. Niet alleen is er een debat over de definitie van trauma, ook de symptoomcriteria van PTSS staan ter discussie. We pleitten voor een meer kindgeoriënteerde benadering van het formuleren van deze criteria. Daarnaast zou het in onze ogen zinvoller zijn om naar beperkingen in het dagelijks leven te kijken dan naar exacte aantallen symptomen voor het bepalen van een diagnose PTSS. Tenslotte is het naar onze mening nodig om een welzijnsbenadering[25] te hanteren in plaats van een pathologie-oriëntatie in het bestuderen van de reacties van kinderen op trauma. De nadruk ligt nog altijd op de negatieve, risicofactoren voor posttraumatische stress, terwijl positieve, beschermende factoren ook belangrijk zijn. We haalden de bijdrage van dit onderzoek aan theorie op het gebied van kinderen en trauma kort aan, zoals het voorstel voor een model van Relationele PTSS en Verwerking, de ordening van copinggedrag bij kinderen en de indeling van strategieën van ouders om responsief om te gaan met hun kind na een schokkende gebeurtenis. Ons uitgangspunt dat kinderen verschillen van volwassenen in de manier waarop ze schokkende gebeurtenissen verwerken, bleef tijdens het onderzoek overeind. Kindspecifieke aspecten bleken bijvoorbeeld de rol van ouders en van knuffelbeesten. Theorievorming op het gebied van kinderen en trauma kan in onze ogen gefaciliteerd worden door stimulerende tijdschrifteisen aan artikelen, via methodologische wegen (bijvoorbeeld door meer longitudinale onderzoeken uit te voeren buiten ziekenhuizen) en door een sterkere samenwerking tussen onderzoekers. Tot slot bespraken we in het hoofdstuk de klinische implicaties (bijvoorbeeld thema's voor gesprekken met kinderen en ouders) en de praktische producten (bijvoorbeeld vragenlijsten en de Toolkit Kind en Trauma) die het project hebben opgeleverd, evenals de hoop dat het project inspiratie biedt voor nieuwe initiatieven die de wereld van kinderen centraal stellen.

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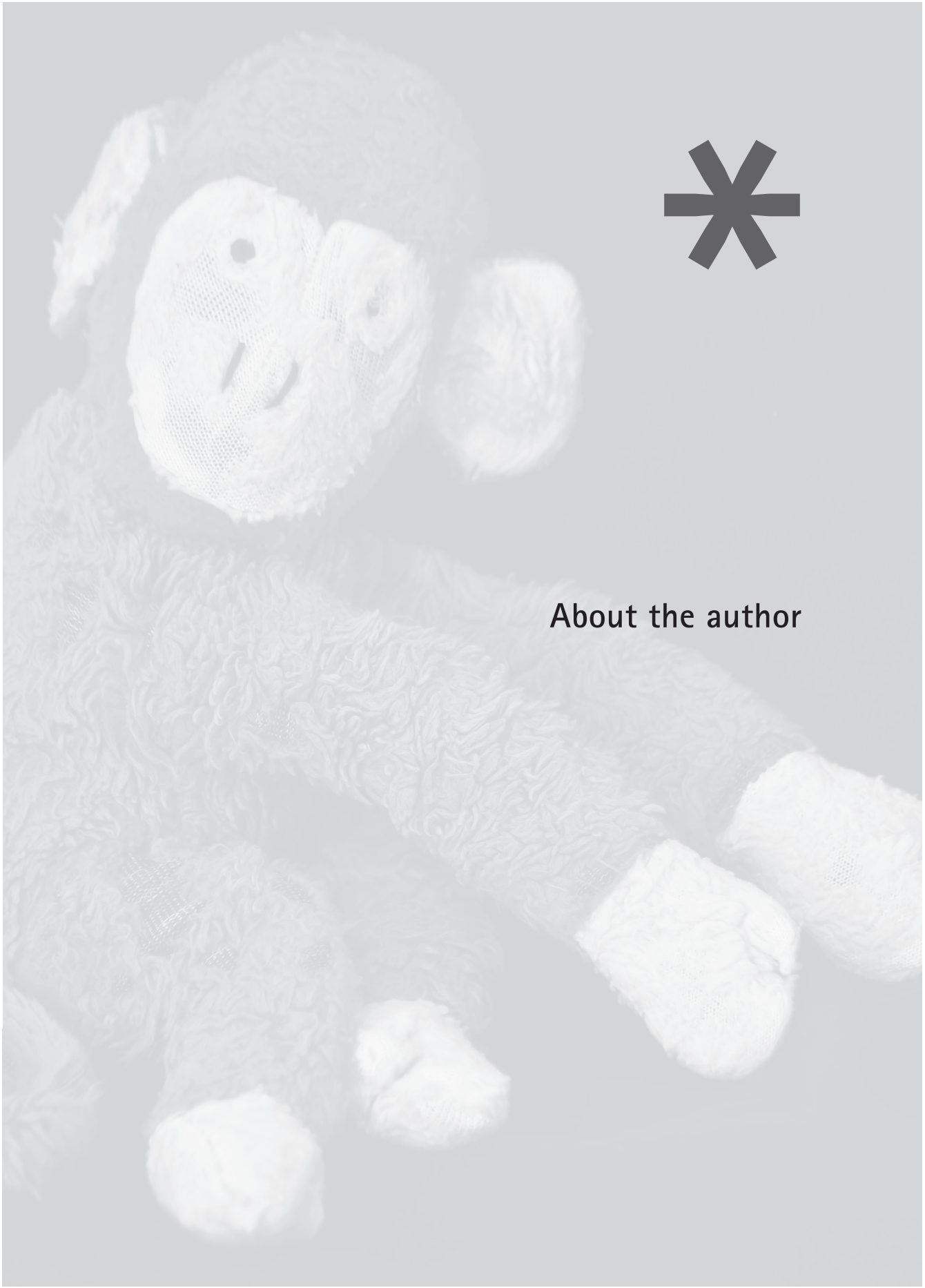
Melbourne, Australië, april 2011



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CURRICULUM VITAE

Eva Alisic (1980) studeerde Personeelwetenschappen en Psychologie aan de Universiteit van Tilburg en Université Pierre Mendès France te Grenoble (Frankrijk) maar is ook geschoold als skileraar en als manschap bij de brandweer. Haar interesse voor het thema 'kinderen en trauma' ontstond tijdens haar vrijwilligerswerk bij de Kindertelefoon. Vooral de veerkracht van kinderen en het centraal stellen van hun beleving hadden haar belangstelling. Na als trainer sociale vaardigheden en casemanager bij Bureau Jeugdzorg en als docent aan de Universiteit van Tilburg gewerkt te hebben, is Eva in 2006 gestart met haar onderzoek bij het Landelijk Psychotraumacentrum voor Kinderen en Jongeren (UMC Utrecht). Om internationaal ervaring op te doen heeft ze begin 2009 meegewerkt aan een project op Harvard Medical School en Children's Hospital Boston. In september 2010 verscheen de *Toolkit Kind en Trauma* van Eva's hand. Deze geeft leerkrachten in het primair onderwijs informatie over en tips voor het ondersteunen van kinderen na schokkende gebeurtenissen en is verspreid onder alle basisscholen en afstuderende Pabo-studenten in Nederland. In hetzelfde najaar heeft Eva vanuit de Nationale DenkTank drie maanden lang het vertrouwen in en het gezag van de Nederlandse politie onder de loep genomen. Ze presenteert haar aanpak en resultaten regelmatig op nationale en internationale congressen en bijeenkomsten.

Eva Alisic (1980) graduated in both Human Resource Studies and Psychology at Tilburg University (Tilburg, the Netherlands) and Université Pierre Mendès France (Grenoble, France) but is also trained as a ski teacher and a fire fighter. Her interest in the topic of 'children and trauma' was born when she volunteered at the Childline, an anonymous telephone service for children. The resilience of children and the focus on their perspective attracted her in particular. After working as a case manager and social skills trainer at Bureau Jeugdzorg (Child and Family Services) and as lecturer at Tilburg University, she started her research at the Psychotrauma Center for Children and Youth (University Medical Center Utrecht, the Netherlands) in 2006. In order to gain international experience, she joined a project at Harvard Medical School and Children's Hospital Boston (USA) in 2009. In September 2010, Eva published the *Toolkit Kind en Trauma* (Toolkit Child and Trauma). It provides teachers in elementary schools with information and tips about supporting children after severe stressors and has been handed to all primary schools and students in the final year of pre-teacher training in the Netherlands. Also in 2010, Eva participated in the Nationale DenkTank (National ThinkTank). During three months, she and her fellow team members analyzed trust in, and authority of, the Dutch police. She regularly presents her approach and results at national and international conferences and meetings.

LIST OF PUBLICATIONS AND SUBMITTED MANUSCRIPTS

Publications

Alisic E, Jongmans MJ, Van Wesel F, Kleber RJ. Building child trauma theory from longitudinal studies: A meta-analysis. *Clin Psychol Rev*; in press.

Alisic E, Boeije HR, Jongmans MJ, Kleber RJ. Children's perspectives on dealing with traumatic events. *J Loss Trauma*; in press.

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Boeije HR, Van Wesel F, Alisic E. Making a difference: Towards a method for weighing the evidence in a qualitative synthesis. *J Eval Clin Pract*; in press.

Alisic E. *Vragenlijsten Onderzoeksdeelname voor Kinderen en Ouders (VOD-K en VOD-O) [Research Participation Questionnaire – Dutch child and parent form]*. Utrecht: UMC Utrecht; 2011.

Alisic E. *Toolkit Kind en Trauma. Informatie voor leerkrachten van groep 5 t/m 8. [Toolkit Child and Trauma. Information for teachers in the last four grades of primary school]*. Utrecht: University Medical Center Utrecht; 2010.

Alisic E, Kleber RJ. Measuring posttraumatic stress reactions in children: Preliminary validation of the Children's Responses to Trauma Inventory. *J Child Adolesc Trauma* 2010; 3:192-204.

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Alisic E, Van der Schoot TAW, Van Ginkel JR, Kleber RJ. Looking beyond posttraumatic stress disorder in children: Posttraumatic stress reactions, posttraumatic growth, and quality of life in a general population sample. *J Clin Psychiatry* 2008; 69:1455-1461.

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Alisic E. *Posttraumatische Groei Vragenlijst voor Kinderen - Nederlandse versie [Posttraumatic Growth Inventory for Children - Dutch version]*. Utrecht: Psychotrauma Center for Children and Youth (University Medical Center Utrecht); 2006.

Alisic E, Eland J, Kleber RJ. *Schokverwerkingslijst voor Kinderen - herziene versie [Children's Responses to Trauma Inventory - revised version]*. Zaltbommel/Utrecht (the Netherlands): Institute for Psychotrauma in collaboration with Clinical Psychology (University of Utrecht) and Psychotrauma Center for Children and Youth (University Medical Center Utrecht); 2006.

Submitted manuscripts

Alisic E, Bus M, Dulack W, Pennings L, Splinter J. Teachers' struggle in supporting children after traumatic exposure. Submitted.

Ellis BH, Alisic E. Maternal emotion coaching: A protective factor for traumatized children's emotion regulation? Submitted.

Ellis BH, Fisher PA, Alisic E, Reiss A, Dishion T. Emotion regulation among preschoolers at risk: The role of maternal emotion socialization. Submitted.

Van Wesel F, Boeije HR, Alisic E, Drost S. I'll be working my way back: A qualitative synthesis on the trauma experience of children. Submitted.

Van Wesel F, Boeije HR, Alisic E. On the origin of hypotheses: Eliciting meta-analysis, metasynthesis and experts. Submitted.