The world is a scary place? INvestigating Treatments and Assessment for Children after Trauma
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Chapter 1

General introduction
Before I started my PhD, I was working as an expert witness. My colleagues and me, we faced children who said to have experienced a traumatic event. It was our job to determine how reliable their report was. We spent a great deal of time listening to these children and asking questions. At some point I could not help but wonder, will a child who experienced a traumatic event ever be able to live a “normal” child’s life again? Are there treatments that help these children? When I read the vacancy for a PhD project for investigating treatment effects of two trauma-therapies in children, I knew that was my chance to find an answer to these questions.

The first part of the general introduction aims to prepare the reader with some basic information about a) PTSD in children and b) methodological concepts. The second part of the introduction gives an overview of the studies that we conducted over the past years and provides the rational for why we conducted these different kinds of studies.

**Trauma and the DSM IV-TR**

Every day, children are exposed to potentially traumatic events like accidents, abuse, disasters or war. American and European studies report that 14–67% of the studied children experienced at least one potentially traumatic event before they reached adulthood (Alisic, van der Schoot, van Ginkel, & Kleber, 2008; Copeland, Keeler, Angold, & Costello, 2007). The majority of these children does not suffer from negative long-term effects. However about 0.5–3% develops full-blown posttraumatic stress disorder (PTSD) and 13.4% suffers from some PTSD symptoms (Copeland et al., 2007; Perkonigg, Kessler, Storz, & Wittchen, 2000). In the fourth edition of the Diagnostic and Statistical Manual for Mental Disorders (text rev. [DSM–IV–TR], American Psychiatric Association, 2000), PTSD symptoms are divided into three symptom clusters: re-experiencing, avoidance and numbing, and arousal. Like the name says, re-experiencing symptoms are characterized by the recurrent re-experiencing of the traumatic event. A person might, for example, have intrusive distressing recollections or distressing dreams of the event. Avoidance symptoms include efforts to avoid thoughts or places that remind a person of the traumatic event. While restricted range of affect and diminished interest in activities are examples of numbing symptoms. Arousal symptoms include difficulties falling asleep or difficulties concentrating. (See Box 1 for an example.)
Box 1.

Alice is 10 years old. About four months ago, she was hit by a car when she crossed the street on her way to school. Luckily she did not suffer much physical damage and has recovered “completely”. However, since the accident, pictures of the moment right before the car hit her suddenly pop into her head and she has difficulties to stop these thoughts. At school, Alice cannot concentrate properly. Consequently, she does not do well at tests and receives bad grades. Sometimes she gets angry all of a sudden and picks a fight with her schoolmates. She also feels very anxious and tense when she is on her way to school because it reminds her of the accident. Every day, she takes a detour to avoid the place where the accident happened.

Her view about herself and the world has also changed. Before the accident, Alice believed that she was a grown up girl, perfectly able to go to school on her own. Now she believes that she is very stupid, too stupid to cross the street on her own without getting hit by a car. She also thinks that the accident was all her fault.

A person is diagnosed with PTSD if he or she suffers from at least one re-experiencing symptom, three avoidance/numbing symptoms and two arousal symptoms. The symptoms are present for at least one month and cause significant impairment in social and/or occupational/school functioning. Not all children meet the required number of re-experiencing, avoidance/numbing or arousal symptoms. If not all criteria are met, a child can be diagnosed with partial PTSD. Carrion, Weems, Ray and Reiss (2002) demonstrated that children with partial and full PTSD do not differ in terms of impairment or distress. Therefore, we focused on children with full and partial PTSD in our research. In the current thesis we refer to a partial PTSD diagnosis if a person either meets the criteria for two of the three symptom clusters (Carlier & Gersons, 1995), or a person reports at least one symptom in each symptom cluster (Stein, Walker, Hazen, & Forde, 1997). When we started this project in 2008 the discussion about criteria for PTSD in the new DSM were in full swing. During the course of our research, it became evident that trauma-related cognitions would play a big role in the upcoming criteria.
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**DSM–5**
In May 2013 the DSM–5 was released and in it several adaptations for PTSD were manifested. Besides the fact that PTSD is now categorized as a trauma– and stressor–related disorder instead of an anxiety disorder, a striking change is the inclusion of a fourth symptom cluster, called “negative alterations in cognitions and mood”. This cluster contains besides others, the two new symptoms: persistent (and often distorted) negative beliefs and expectations about oneself or the world (e.g., “I am bad,” “The world is completely dangerous”); and persistent distorted blame of self or others for causing the traumatic event or for resulting consequences (APA, 2013). The addition of these symptoms results from a growing body of research demonstrating that people with PTSD show alterations in cognitions about themselves, the world and other people as a consequence of their traumatic experience. A positive relationship between PTSD symptoms and trauma–related cognitions has been found in different populations, for example in adult child sexual abuse survivors, patients with spinal cord injuries, firefighters and in children exposed to an assault or a motor vehicle accident (Agar, Kennedy, & King, 2006; Bryant & Guthrie, 2007; Meiser–Stedman et al., 2009; Wenninger & Ehlers, 1998).

**Measuring PTSD: Do you measure what you want to measure und do you always get the same results?**
In the previous paragraphs we have seen that PTSD is a complex construct, whether we apply DSM–IV–TR or DSM–5 criteria. It consists of several symptom clusters which each contains different symptoms. Therefore, the assessment of PTSD is often a complex task, especially in children who are verbally less competent than adults. Thus instruments for adults need to be adapted before they are implemented in children. There are quite a few assessment tools, both interviews and questionnaires, but in comparison with assessment tools for adults, instruments for children are less well researched. Yet for a profound diagnosis, reliable and valid assessment tools are essential. A reliable instrument is consistent in itself (i.e., all items in a scale measure the same construct), consistent over time, and consistent across raters. A valid instrument accurately measures the concept of interest (e.g., PTSD). For example, I step on my scale and no matter how often I try, it shows 20 kilos. A physician would tell me that it is not possible that a living woman in her thirty’s, who is about 1.75 meters tall, weighs only 20 kilos. This situation tells me that my scale is reliable but not valid.
After diagnostics: What to do about PTSD? And what is the deal with randomized controlled trials?

With a reliable and valid tool for the assessment of PTSD, we can find out if a child suffers from PTSD and needs treatment. International guidelines for the treatment of PTSD advise Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) for the treatment of children (Foa, Keane, Friedman, & Cohen, 2008; National Institute for Health and Care Excellence [NICE], 2005). Generally, TF-CBT protocols make use of components summarized by the acronym PRACTICE: Parental skills or parental treatment, Psychoeducation; Relaxation and stress management skills; Affective expression and modulation skills; Cognitive coping skills; Trauma narrative and cognitive processing of the child’s traumatic experiences; In vivo desensitization to trauma reminders; Conjoint child–parent sessions; and Enhancing safety and future development (Foa et al., 2008). The core element of TF-CBT is the trauma-narrative. Together with the therapist, children write down their story of the traumatic event. Working on the trauma-narrative serves two purposes: First, the child gets repeatedly exposed to the traumatic memory which leads to habituation and stress reduction; second, the unhelpful cognitions a child may have with respect to the traumatic event are revealed and with aid of the therapist changed into more helpful cognitions.

Although TF-CBT is the most researched therapy for children with PTSD, critics have indicated that there are several limitations to the therapy itself and the research that has been conducted on the evaluation of TF-CBT so far: First, most RCT’s have been conducted in children who had been sexually abused. Second, after treatment, many children still suffer from PTSD. Third, when compared to active control conditions, the effect of TF-CBT on co-morbid problems is inconclusive (NICE, 2005; Stallard, 2006). Especially the last two points advocate for the investigation of different protocols besides TF-CBT. One of these is Eye Movement Desensitization and Reprocessing (EMDR).

About 25 years ago, Francine Shapiro introduced EMDR for the treatment of PTSD (1989). In this relatively new treatment approach, patients follow the finger of the therapist moving horizontally while thinking about the traumatic event. This is done throughout several consecutive series until the traumatic memory is experienced as less distressing. The NICE guidelines for PTSD judged EMDR to show promising results for the treatment of children (2005). However since it is less well researched, they are more reserved in their recommendations for EMDR than in their recommendations for TF-CBT.
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The gold standard for the research of treatment approaches is a randomized controlled trial (RCT). In an RCT, participants are randomly assigned to one of two or more conditions. In treatment outcome studies these are either active treatments or waitlist conditions. An RCT is a powerful tool because if executed well, the characteristics of patients in condition A do not differ from the characteristics of patients in condition B. This gives assurance that a difference between the groups is attributable to the different treatment conditions and no artifact of some confounding variable. (See Box 2 for further detail.)

Box 2.

Alice’s parents have registered her for therapy at a center for child and adolescent trauma. Here they agree to take part in a scientific research project. In this research project, two different treatments are compared. One is called TF-CBT and the other one EMDR. Alice will receive one of both therapies. Which one is yet unknown to the researcher and the therapist and will be assigned by chance. The researcher explains that she will not know which treatment Alice will receive and that it is important that she does not tell her. If the researcher knew which therapy Alice receives, this could influence the results of the interview that Alice receives after treatment in a positive or negative way. This could lead to unfair results for the whole study.
Overview of the conducted studies

- Is the CAPS–CA a valid and reliable instrument?
- Are TF–CBT and EMDR effective and efficient?
- Does therapy reduce trauma-related cognitions?
- Is the CPTCI a valid and reliable instrument?
- Chapter 2: Assessment of PTSD
- Chapter 3 and Chapter 4: Treatment of PTSD
- Chapter 5: Treatment of trauma-related cognitions
- Chapter 6: Assessment of trauma-related cognitions

Chapter 2: On our way to a reliable and valid Dutch assessment tool for PTSD

When I started this PhD project, a Dutch diagnostic interview for the assessment of PTSD in children that had proven to be reliable and valid was lacking. For this reason, we took a first step to validate the Dutch Clinician-Administered PTSD Scale for Children and Adolescents (CAPS-CA, Nader et al., 1996). The CAPS-CA is the child version of the adult CAPS (Blake et al., 1995). In line with the adult version, the CAPS–CA investigates the 17 PTSD symptoms conform DSM–IV–TR standards. An advantage of the CAPS–CA over other diagnostic instruments is that besides determining the presence or absence of a symptom, the interviewer assesses the frequency, and the intensity of each symptom on four-point Likert scales. Adding up the frequency and intensity score of an item results in its severity score. An overall severity score can be computed by summing up all 17 severity scores. Thus besides information about the diagnostic status of a patient the CAPS–CA provides information about the seriousness of the PTSD problems.

For the validation of the CAPS–CA, we worked together with the psychotrauma center for children and adolescents of the mental health institute...
Chapter 3: Moving on to the treatment of PTSD in children
A second preparative study for our treatment outcome study (which is described in Chapter 4) became necessary, when in the course of time, we adapted the inclusion criteria of our trial. Due to slow recruitment, we broadened our inclusion criteria from children who had experienced a road-traffic accident to children who had experienced multiple-event traumas. The term multiple-event trauma refers to traumatic events that occurred over a period of time in the past. Examples are domestic violence and sexual, verbal or physical abuse, which all can be covered with the term child-maltreatment. Since maltreatment is not only associated with PTSD, but also with anxiety, depression, suicidal ideation and substance abuse (Kilpatrick et al., 2000; Ruchkin, Henrich, Jones, Vermeiren & Schwab-Stone, 2007; Wasserman & McReynolds, 2011), we wanted to find out if TF-CBT and EMDR have shown to be effective interventions for children who were exposed to maltreatment. Therefore, the objective of our review was to describe and evaluate the effects of psychotherapeutic treatments on PTSD and related problems for children exposed to childhood maltreatment. We searched different literature databases for relevant articles. Search terms included (psychological) trauma, children, and treatment. This search resulted in 17,077 hits. Further methodology and the results of this review are described in Chapter 3. At this point of the dissertation it is important to know that for maltreated children, TF-CBT is the best supported treatment. EMDR-studies showed promising results.

Chapter 4: TF-CBT and EMDR – effective and efficient?
According to international guidelines (Foa et al., 2008; NICE, 2005) TF-CBT is the first choice treatment for PTSD in children. Although less well researched than TF-CBT, EMDR has also shown promising results over the past years. Two
RCTs have directly compared the effects of (protocols similar to) TF–CBT and EMDR in children with PTSD symptoms: In 2004, Jabergahderi, Greenwald, Rubin, Zand and Dolatabadi published the first RCT of TF–CBT versus EMDR. They randomly assigned 14 sexually abused Iranian girls to either condition. The 12–13 year old girls received up to twelve therapy sessions. The authors found no significant differences between TF–CBT and EMDR. Both treatments resulted in the reduction of PTSD symptoms and behavioral problems. Treatment duration however was significantly shorter for EMDR than for TF–CBT (mean number of sessions was six versus eleven). Limitations of this study included that no TF–CBT consultant was involved in the study; early treatment termination criteria varied between EMDR and TF–CBT; and the sample size was very small.

In a second RCT, de Roos et al. (2011) investigated the effects of EMDR and CBT in 52 children who had been exposed to an explosion of a fireworks factory in the Netherlands. The 4–18 year old children received up to four 60-minutes sessions of either treatment. Early treatment termination was possible if children and parents reported that the child was asymptomatic and if the child, parent and therapist agreed that no further treatment was necessary. The results indicated that both, EMDR and CBT reduced symptoms of PTSD, depression, anxiety and behavioral problems to the same degree. This study showed that EMDR was more efficient, too. Children needed about three sessions when treated with EMDR compared to four when treated with CBT. Critics argued that the CBT protocol in this study was not TF–CBT.

Our RCT was the first to compare eight sessions protocols of TF–CBT and EMDR. Our goal was to investigate the effects of these protocols in the outpatient setting. Furthermore we wanted to find out which treatment was more efficient. At first, we planned to include a relatively homogeneous group by recruiting only children who had experienced a road traffic accident. However due to slow recruitment, we adapted our inclusion criteria and also included children who experienced other single–event traumas and multiple–event traumas. An advantage of the broader inclusion criteria was, that we included a diverse patient population in our study. Therefore our results are more generalizable to different populations. Furthermore, our results show high ecological validity. We conducted our trial in a general outpatient setting, mirroring the setting of most departments of child and adolescent psychiatry in which children who experienced all kinds of traumatic events are treated.
Unlike previous studies, we investigated treatment outcome by means of a validated semi-structured clinical interview; the CAPS-CA which showed adequate psychometric properties in Chapter 2. Children also filled out questionnaires related to PTSD, anxiety and depression. Furthermore, we administered a PTSD interview to the parents and asked them to fill out questionnaires related to anxiety, depression and behavioral problems of the child. Additionally, we paid extra attention to the efficiency of both treatments. Comparable to the studies by Jaberghaderi et al. (2004) and de Roos et al. (2011) treatment could be terminated early. Yet unlike in the study by Jaberghaderi et al. (2004), in our study termination criteria were the same in both treatment groups. Opposed to both studies, for early treatment termination we applied next to subjective measures also a more objective measure: Children had to score lower than ten points on the Children’s Revised Impact of Event Scale (CRIES–13, Dyregrov & Yule, 1995; Perrin, Meiser-Stedman, & Smith, 2005).

The study is described in full detail in Chapter 4. One glimpse at the results however tells us that TF-CBT and EMDR are both effective and efficient in the treatment of PTSD according to DSM-IV-TR criteria in children.

**Chapter 5: From DSM-IV to DSM-5 – What to do about those trauma-related cognitions?**

We are now confronted with the new DSM-5 criteria in which several changes in the criteria for PTSD are manifested. One of these is the inclusion of trauma-related cognitions. This adaptation has consequences for diagnosing PTSD and also for its treatment. We cannot draw comprehensive conclusions, however, about which therapy or treatment components most effectively reduce trauma-related cognitions. Therefore, we conducted a meta-analysis, with the goal to determine the effects of psychotherapy on trauma-related cognitions. Since a) there were hardly any studies that were conducted in children and b) no meta-analysis was published with this question in adults, we did not limit our meta-analysis to children. International guidelines advise TF-CBT or EMDR for the treatment of adults with PTSD (Foa et al., 2008; NICE, 2005). Therefore we proposed in our first hypothesis that trauma-focused treatments would outperform nontrauma-focused treatments and nonactive conditions. Trauma-focused CBT in adult populations includes interventions like Prolonged Exposure and Cognitive Processing Therapy. While imaginal and in vivo exposure are the main components of Prolonged Exposure (Foa,
Hembree, & Rothbaum, 2007), cognitive restructuring is the main component of Cognitive Processing Therapy (Resick & Schnicke, 1992). Through cognitive restructuring, the therapist directly targets unhelpful cognitions and tries to change them into more helpful, healthy cognitions. Prolonged Exposure and Cognitive Processing Therapy have demonstrated to diminish PTSD as defined in the DSM–IV–TR (Powers, Halpern, Ferenschak, Gilhan, & Foa, 2010). However, since cognitive restructuring directly targets trauma–related cognitions, we proposed in our second hypothesis that treatments that include modules of cognitive restructuring lead to larger reductions in trauma–related cognitions than treatments that include exposure but no cognitive restructuring.

Our search of several literature databases for relevant studies resulted in more than 6000 hits. From these we identified 20 relevant articles. The methodology and results of our meta–analysis are described in detail in Chapter 5. For now it is important to know that we only found one study in adolescents that fulfilled our criteria. Furthermore, we did not find any study in which participants were treated with EMDR.

Chapter 6: And again – What about the children? On the way to a reliable and valid Dutch assessment tool for trauma–related cognitions

Our meta–analysis showed yet again that research in children is falling behind research in adults. Although several RCTs have been conducted in children with PTSD (e.g., Cary & McMillen, 2012) in only one of these a valid questionnaire that assessed trauma–related cognitions was used. However by including trauma–related cognitions in the criteria for PTSD in DSM–5, the assessment of these cognitions has become essential. The Child Posttraumatic Cognitions Inventory (CPTCI, Meiser-Stedman et al., 2009) assesses trauma–related cognitions in children. This questionnaire is freely accessible in eleven languages on the website childrenandwar.org. However, only the original English version has been validated. The questionnaire consists of 25 items that form two subscales: the permanent and disturbing change subscale (CPTCI–PC) and the fragile person in a scary world subscale (CPTCI–SW). The previous includes items that focus on the negative effect the frightening event had on the child and his/her perception of the future in the light of the frightening event. Examples are: “My reactions since the frightening event mean I have changed for the worse”; “My life has been destroyed by the frightening event.” The items of the CPTCI–SW
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subscale inquire about the child’s own sense of weakness and the perception of the world and other people as threatening: “I am a coward.”; “I have to watch out for danger all the time.” Chapter 5 of this thesis reports the validation study of the Dutch version of the CPTCI.

Again, we included participants at the psychotrauma center for children and adolescents of the mental health institute Rivierduinen in Leiden and at an academic center for child and adolescent psychiatry (de Bascule) in Amsterdam. Additionally, we collected data at different elementary and secondary schools in the region of Amsterdam. In total, our sample consisted of 502 children (184 in the clinical sample and 318 in the school sample). We investigated the factor structure of the CPTCI and further examined its reliability and validity. We collected pretreatment and posttreatment data from some children in the clinical sample, who were treated with either TF–CBT or EMDR. Therefore we were able to calculate the correlation between the change score in PTSD (as measured with the CAPS–CA) and the change score on the CPTCI. This data gives us an indication if TF–CBT and EMDR also reduce trauma–related cognitions.

Chapter 7: What do we know and where do we go?

After all studies have been described in detail, we will finish this thesis with an integral overview of the study results, a holistic discussion and implications for future research.