

School-based intervention programs for symptoms of traumatic stress



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*Hope is important because it can make the present
moment less difficult to bear.*

*If we believe that tomorrow will be better,
we can bear a hardship today.*

~Thich Nhat Hanh (1991)

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Abstract

This thesis attempts to provide an up-to-date overview of school-based intervention programs for symptoms of traumatic stress. The objectives were: 1) to identify school-based intervention programs for preventing or reducing symptoms of traumatic stress, 2) to examine the effectiveness of the intervention programs, and 3) to identify the accordance of the intervention programs with three current theories of posttraumatic stress disorder (PTSD).

The three main academic databases used to locate the studies for this thesis were *ERIC*, *PsycINFO*, and *MEDLINE*. Inclusionary/exclusionary criteria included: 1) use of a control group, 2) use of randomized/quasi-experimental design, 3) school setting, 4) participant exposure to a traumatic event, 5) targeted at the prevention/ reduction of symptoms of traumatic stress, 6) use of standardized instruments, and 7) not targeted Type II trauma. Using these criteria, 19 studies conducted in 11 different countries were selected.

Unfortunately, school-based studies conducted in Norway were not located.

The selected studies dealt with various types of trauma exposure such as natural disasters, community violence, and war. Fourteen of the studies used cognitive-behavioral therapy (CBT) methods as the main treatment approach. Other treatment approaches used included Eye Movement Desensitization and Reprocessing (EMDR), mind-body techniques (e.g., guided imagery, relaxation techniques, and meditation), play therapy, art therapy, and drama.

The findings of this thesis suggest that intervention provided within the school setting can be effective in helping children and adolescents following a variety of traumatic events. The majority of the studies had good results in relation to reducing symptoms of PTSD. Of the 19 studies, 14 had effect sizes in the medium to large range. Most of the intervention programs were found to be in accordance with the treatment recommendations of the three theories presented; however, none appeared to be explicitly based on the theories.

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1.0 Introduction

All children and adolescents face stressful situations during the course of growing up. Most often, stressful events provide healthy learning situations where one gain skills to deal with normal daily stress. Unfortunately, childhood and adolescence is not limited to normal daily stress. Many face highly challenging and dramatic life events. Some of these events are so distressing that mental health can be significantly affected (Shalev, 1996). According to an estimate from the Norwegian Institute for Public Health (Nasjonalt folkehelseinstitutt, 2006), 15-20% of all children and adolescents in Norway have mental health difficulties. Exposure to traumatic events is likely to be the cause of a substantial number of such difficulties (McFarlane & Yehuda, 1996).

Surviving or witnessing a serious accident, surviving a natural disaster, witnessing violence, and experiencing the sudden or violent loss of a loved one are examples of events that can cause symptoms of traumatic stress. Following the occurrence of such events, schools can likely play an important role in helping students to regain a sense of security and hope. Activities and discussions provided individually or within groups (e.g., entire class or small groups) allow students to understand what happened to them, express feelings, and learn positive ways of coping (Dyregrov, 2008). When a number of students are affected, schools can also be an ideal location for providing specific intervention programs (Pynoos & Nader, 1988, 1993).

There is information available in Norwegian educational literature regarding suggestions for teachers and other school personnel working with students who have experienced traumatic events (e.g., Dyregrov, 2008; Raundalen & Schultz, 2006). Despite this, an overview of school-based intervention programs currently does not exist. Therefore, the purpose of this thesis was to develop an up-to-date overview of school-based intervention programs for symptoms of traumatic stress. This was with the hope that such an overview might be helpful in informing the development and implementation of intervention programs within the Norwegian school setting.

1.1 History

The understanding that traumatic events can have a psychological impact on individuals has long been recognized. From the mid 19th century to the mid 20th century, a number of

diagnostic terms were proposed to explain the symptoms of individuals who experienced severely stressful events. Examples include railroad spine, traumatic neurosis, anxiety neurosis, soldiers' heart, shell shock, post-trauma syndrome, and war neurosis. Many of these terms were based on the psychological reactions seen in World War I and World War II soldiers (van der Kolk, Weisæth, & van der Hart, 1996; William Yule, Williams, & Joseph, 1999).

A great deal of attention was placed on traumatic stress in the 1970s. This was due to the psychological reactions seen in soldiers of the Vietnam War as well as the emergence of research on trauma in women and children (van der Kolk et al., 1996). In 1980, the diagnostic term posttraumatic stress disorder (PTSD) was included in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) as a distinct diagnosis (American Psychiatric Association, 1980). According to Brewin and Holmes (2003), its inclusion spurred a considerable amount of research as well as the development of new theories based on the findings. However, it was not until the manual was revised in 1987 (DSM-III-R) that the disorder was first applied to children and adolescents. This was due to research confirming that children and adolescents were also prone to developing PTSD after exposure to traumatic events (Amaya-Jackson, 2000).

1.2 Scope, definitions and delimitations

In order to specify the scope of this thesis as well as to ensure clarity, it is necessary to define a few terms and concepts. The term *trauma* has a variety of meanings. It is often used in our everyday language to refer to situations that are stressful for individuals. These can range from mildly to extremely psychologically stressful situations. Trauma is also used medically in relation to severe physical injury. Spinal trauma and abdominal trauma are examples of this. For the purpose of this thesis, however, Dyregrov's (2000) definition of psychological trauma is most appropriate. According to him, psychological trauma involves the exposure to an overwhelming and uncontrollable event. This exposure leads to a situation where the individual is faced with extraordinary stress. He explains that situations that are traumatic for one child or adolescent are not necessarily traumatic for another. Several factors play into whether an event is experienced as traumatic or not. Examples of such factors include the child or adolescent's current level of development and preparedness for the event.

Due to the nature of many traumatic events, death can unfortunately be a result. According to Cohen and Mannarino (2004), children and adolescents can experience *childhood traumatic grief* following the death of a loved one. This condition interferes with the normal grieving process due to the presence of trauma symptoms. It occurs when the child or adolescent perceives the death of their loved one as traumatic. They explain that the circumstances of the death do not, however, need to be due to a sudden and unexpected event. That is, childhood traumatic grief can occur in situations where the death was anticipated (e.g., cancer). The determining factor for the development of the condition therefore rests on the child or adolescent's perception of the death.

In this thesis, *symptoms of traumatic stress* will refer to the cognitive, behavioral, and emotional problems a child or adolescent may experience following a psychologically traumatic event. This will include symptoms of posttraumatic stress disorder (PTSD) as well as symptoms of other types of other mental health difficulties such depression, anxiety, and childhood traumatic grief. However, emphasis will be placed on symptoms of posttraumatic stress disorder (PTSD).

Posttraumatic stress disorder (PTSD) is classified in both the *DSM-IV-TR* (American Psychiatric Association, 2000) and the *ICD-10* (World Health Organization, 1992) diagnostic classification systems. The criteria used by both systems are largely similar (see Appendices A and B). In the *DSM-IV-TR*, there a total of six diagnostic criteria for PTSD. The first criterion, criterion A, involves the type of exposure to a traumatic event (e.g., actual or threatened death) and the types of responses that were engendered at the time of the event (i.e., intense fear, helplessness, or horror). Criteria B, C, and D involve the presence of persistent symptoms that are a result of the event (i.e., re-experiencing, avoidance/numbing, and increased arousal). Criterion E requires that symptoms must have been present for a duration greater than one month. Finally, criterion F requires that functioning be significantly affected by the disturbance.

Terr (1991) has proposed two broad categories of childhood trauma. The first, *Type I trauma*, refers to trauma that is the result of a single event. This includes events such as vehicle accidents, natural or man-made disasters, acts of community violence, and the sudden death of family member or friend. The second category, *Type II trauma*, refers to trauma that is result of multiple events. Here, the child is repeatedly exposed to traumatic situations. Sexual abuse, physical abuse, maltreatment, and domestic violence are examples of situations that

are often ongoing and can cause Type II trauma. In addition to these two broad categories, Terr has also proposed that *Crossover Type I-II trauma* can occur when a child is faced with ongoing stress following a single traumatic event. As a consequence of this trauma type, characteristics from both trauma types can be observed. Physical injuries that leave a child handicapped and homelessness are examples of single events that can lead to Crossover Type I-II trauma.

This thesis will be limited to intervention to prevent and treat Type I trauma in the school setting. Type II trauma caused by sexual abuse, physical abuse, maltreatment, and domestic violence will not be addressed. This decision was based on recent recommendations that trauma resulting from these types of events requires a treatment approach which is more complex and takes place over a longer period of time than trauma resulting from single events (Courtois, 2004).

Regarding the overall format of this thesis, a combination of the outlines suggested for *reports of empirical studies* and *review articles* in the Publication Manual of the American Psychological Association (2001, p. 7) will be used.

1.3 Recent research findings

As discussed in section 1.1, interest in traumatic stress was renewed in the 1970s. Research since this time has led to a number of important findings in relation to posttraumatic stress disorder (PTSD). Due to the time and length constraints of this thesis, it was not possible to develop a comprehensive overview. However, the findings of some recent research will be highlighted in relation to the four following areas: 1) prevalence, 2) comorbidity, 3) memory impairment, and 4) predictors. These areas were chosen because of their particular relevance to this thesis.

1.3.1 Prevalence

Lifetime prevalence estimates of PTSD vary. According to Fairbank, Ebert, and Caddell (2001), estimates in the United States have ranged from 1 to 12.3% among the adult population. They note that research indicates that the type of trauma experienced influences the degree of likelihood of developing PTSD.

The results of a study known as the *National Comorbidity Survey* (NCS) conducted in the United States between 1990-1992 found that individuals have a reasonable chance of being exposed to a traumatic event at one point or another in their lifetime (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). The study found that 51.2% of men and 60.7% of women between the ages of 15 to 54 years had been exposed to at least one traumatic event in their lifetime. Despite this high exposure rate, the study found the lifetime prevalence rate of PTSD to be much lower at a level of 7.8% in the sample.

The *National Comorbidity Survey Replication* (NCS-R) replicated the original NCS study in 2001-2003 and found similar results in relation to the prevalence of PTSD (Kessler, Berglund, Demler, Jin, & Walters, 2005). At this time, lifetime prevalence rate of PTSD was found to be 6.8% among adults between the ages of 18 to 44 years. They projected the lifetime risk of PTSD to be at a level of 8.7% at 75 years. In relation to the 12-month prevalence rate of PTSD, only 3.5% of the sample was found to be affected (Kessler, Chiu, Demler, & Walters, 2005). The severity of PTSD in the 12-month cases were fairly evenly distributed between serious (36.6%), moderate (33.1%), and mild (30.4%).

According to Dalglish, Meiser-Stedman, and Smith (2005), epidemiological data on the prevalence of PTSD is limited in relation to children and adolescents. In similarity to adults, they note that lifetime prevalence estimates for children and adolescents vary widely. In addition, as with adults, they note that the degree of likelihood of developing the disorder is related to the type of trauma experienced.

Regarding children and adolescents, the results of three studies conducted in Norway and Sweden are particularly interesting in relation to this thesis. First, a recent study based in Norway looked at the effects of exposure to the 2004 tsunami in Southeast Asia on children and adolescents' development of posttraumatic stress reactions (Jensen, Dyb, Hafstad, Nygaard, & Lindgaard, 2008). The Norwegian Centre for Violence and Traumatic Stress Studies (NKVTS) conducted the study. The children and adolescents who were selected for the study had been on vacation in affected areas at the time of disaster. Participants completed a questionnaire 6 months after the tsunami and were interviewed 10 months and 2 ½ years after the tsunami. The results of the 6-month questionnaire found that three out of four of the participants reported posttraumatic stress reactions during the month preceding the questionnaire. Those with the greatest reactions were found to be the children and adolescents who were most directly affected by the tsunami (e.g., injured/death of a loved one). At the

10-month interview, 12% of the participants were found to have severe levels of posttraumatic stress reactions. The percentage, however, dropped substantially by the time of the second interview at 2 ½ years. At this time, 4% were found have severe levels of posttraumatic stress reactions.

In a second study based in Norway, researchers looked at the prevalence of mental health disorders in seven to nine year-old children in the general population (Heiervang et al., 2007). This study was conducted with all children in grades two to four in the city of Bergen. The overall prevalence of mental health disorders in this sample was found to be approximately 7%. However, the proportion of children found to have PTSD was low at a level of .11% (95% confidence interval: 0-0.23%).

Finally, in a study based in Sweden, researchers looked at the prevalence of PTSD in adolescent survivors of a discotheque fire 18 months following (Broberg, Dyregrov, & Lilled, 2005). Of the approximately 400 adolescents who were at the locality at the time of the fire, 63 were killed and 213 were physically injured. The study found a high level of posttraumatic stress among the participants with a total of 25% meeting criteria for PTSD.

These three studies demonstrate that prevalence estimates of PTSD vary based on the types of participants. In the study of the general population, the prevalence rate was found to be low. However, in the two other studies where the participants were known to have been exposed to a traumatic event, the prevalence rates were much higher.

1.3.2 Comorbidity

Epidemiological studies indicate that PTSD commonly occurs along with other mental health disorders (Fairbank et al., 2001). For example, the NCS-R study found that the comorbidity rate between PTSD and other *DSM-IV* mental disorders was 75% in the 12-month cases (Kessler, Chiu et al., 2005). According to Fairbank et al. (2001), research also indicates that physical health and life adjustment problems are also associated with the disorder.

1.3.3 Memory impairment

Research findings have shown that PTSD appears to affect a number of psychological processes such as memory (Brewin & Holmes, 2003). The results of a recent meta-analysis by Brewin, Kleiner, Vasterling, and Field (2007) indicate that there is an association between

PTSD and memory impairment. Furthermore, there appears to be a stronger association between PTSD and verbal memory deficits than between PTSD and visual memory deficits.

In a review of research literature since 2000, Brewin (2007) found that research suggests that trauma memories are quite different from non-trauma memories in individuals with PTSD. In particular, trauma memories appear to be both more fragmented and disorganized than non-trauma memories. However, in relation to individuals without PTSD, the same pattern does not appear. That is, trauma memories do not appear to be more fragmented and disorganized than non-trauma memories in these individuals.

1.3.4 Predictors of PTSD

A recent meta-analysis by Ozer, Best, Lipsey, and Weiss (2003) investigated various predictors of PTSD. Their findings indicate that peritraumatic dissociation is a stronger predictor of PTSD symptoms and diagnosis than prior characteristics (i.e., prior trauma, prior adjustment, family history of psychopathology). In a similar meta-analysis, Brewin, Andrews, and Valentine (2000) found that the perceived lack of social support is a stronger predictor of PTSD than prior characteristics (e.g., gender, intelligence, prior trauma). The study also found that additional life stress and trauma severity are somewhat more predictive of PTSD.

1.4 Theory

Over the years, a number of theories have been proposed to explain the symptoms witnessed in individuals who have experienced traumatic events. Three current theories of PTSD will therefore be presented to highlight current understandings of how the disorder affects individuals. These theories are emotional processing theory (Foa & Rothbaum, 1998), dual representation theory (Brewin, Dalgleish, & Joseph, 1996), and Ehlers and Clark's cognitive model (Ehlers & Clark, 2000). They were selected because each of them has been successful at incorporating a variety of current research findings in relation to PTSD and memory (Brewin & Holmes, 2003).

Emotional processing theory, dual representation theory, and Ehlers and Clark's cognitive model are all theories of PTSD in adults. Childhood theories have been proposed, however, they are presently not fully adequate at incorporating what is currently known about the

disorder and how it affects children and adolescents (Meiser-Stedman, 2002). Therefore, no childhood theories were selected for this overview. According to Meiser-Stedman (2002), theories of PTSD in adults, particularly dual representation theory and Ehlers and Clark's cognitive model, can provide a framework for understanding PTSD in children and adolescents.

The focus of the following three sections will be to provide an overview of each of the theories and to discuss what they emphasize in regards to treatment. Following each overview, implications for school-based intervention programs will be touched on briefly. The rationale for not going into greater detail in regards to such implications is that the purpose of this thesis was to *identify* existing programs and their demonstrated outcomes rather than to *develop* a school-based program. To conclude each overview, existing empirical support will be presented.

1.4.1 Emotional processing theory

Foa and Kozak (1986) proposed emotional processing theory to guide the understanding and treatment of anxiety disorders. In the first version of the theory, PTSD was included as a type of anxiety disorder. However, the theory was later applied directly to PTSD by Foa and Riggs (1993) and Foa and Rothbaum (1998).

According to Foa and Kozak (1986), emotional processing theory builds on Lang's (1977, 1979) bioinformational theory of fear. Fear is therefore conceptualized as being represented in memory as a cognitive structure that functions as a *program* for escaping or avoiding danger. The information contained in the structure includes associated stimulus, response, as well as meaning elements.

According to the theory, a fear structure that represents a realistic threat is considered to be a *normal* fear structure. On the other hand, a fear structure is considered *pathological* when it represents a threat that is unrealistic. This is proposed to be the case of PTSD. Here, the fear structure links largely harmless trauma cues with a feeling of danger or incompetence (Foa, Huppert, & Cahill, 2006).

At the center of the theory is the concept of *emotional processing*. The goal of emotional processing is to incorporate new information into the individual's existing knowledge so that

fear and associated symptomatology will be reduced. The process can occur naturally or through therapeutic intervention.

Foa, Huppert, and Cahill (2006) posit behavioral and cognitive avoidance as the first of two factors that contribute to the persistence of pathological fear structures. Cognitive biases in processing information during encoding, interpretation, and retrieval are posited as the second factor. According to Foa, Huppert, and Cahill, these two factors interfere with acquisition of information that can correct the inconsistencies that exist in the pathological fear structure and can in turn lead to the process of recovery.

In application of emotional processing theory to PTSD (Foa & Riggs, 1993; Foa & Rothbaum, 1998), the fear structure of PTSD is suggested to have essentially the same characteristics as other pathological fear structures. These characteristics, which distinguish pathological fear structures from normal fear structures, include: 1) response elements that are excessive (e.g., avoidance of safe situations), 2) stimulus-stimulus associations that are inaccurate in relation to reality, 3) harmless stimuli that are associated with escape or avoidance responses, and 4) harmless stimuli and response elements that are associated with threat's meaning (e.g., danger).

According to Foa and Rothbaum (1998), the theory posits that the number of stimulus elements associated with danger are particularly large in the case of PTSD fear structures. This leads to the individual viewing the world as extremely dangerous. PTSD fear structures are also posited to include erroneous associations. These associations lead to the individual viewing him or herself as incompetent. In addition to these characteristics, Foa and Riggs (1993) suggest that trauma memories have a disorganized and fragmented nature that is a result of disrupted and selective information processing during the traumatic event. They explain that the reason for the information processing deficits is the extreme distress that an individual experiences at the time of the trauma.

Natural recovery

Foa and Cahill (2001) propose that natural recovery from the viewpoint of emotional processing theory occurs through engagement in various daily activities. These activities include engaging with trauma-related thoughts and feelings, sharing these thoughts and feelings with others, and confronting trauma-related stimuli in the natural environment. The

repeated activation of the trauma memory provided by these activities, along with absence of additional traumas, helps the individual to disconfirm the post-trauma perceptions that the world is dangerous and that he or she is incompetent. Additionally, talking and thinking about the event helps the individual create an organized trauma narrative and reduce negative emotions associated with the trauma.

Development of PTSD

According to Foa and colleagues (Foa & Riggs, 1993; Foa & Rothbaum, 1998), three interrelated factors influence emotional processing and determine whether an individual develops chronic PTSD or manages to recover from a traumatic event. The factors include: 1) the individual's pre-trauma schemas (regarding the world and self) and pre-trauma records of specific events, 2) the individual's trauma records of the event itself, and 3) the individual's post-trauma records of experiences following the traumatic event.

Foa and Rothbaum (1998) suggest that rigid pre-trauma schemas, both those that are extremely positive and those that are extremely negative, hinder successful emotional processing following a traumatic event. This can occur in two ways. First, an individual who holds extremely positive schemas (i.e., sees him or herself as extremely competent and the world as extremely safe) may experience emotional processing difficulties because the trauma violates their existing knowledge to a rather large degree. This can result in the individual viewing him or herself as completely incompetent and the world as highly dangerous. Second, an individual who holds extremely negative schemas (i.e., sees him or herself as extremely incompetent and the world as extremely dangerous) may also experience emotional processing difficulties. This is because the individual sees the trauma as confirming his or her negative views.

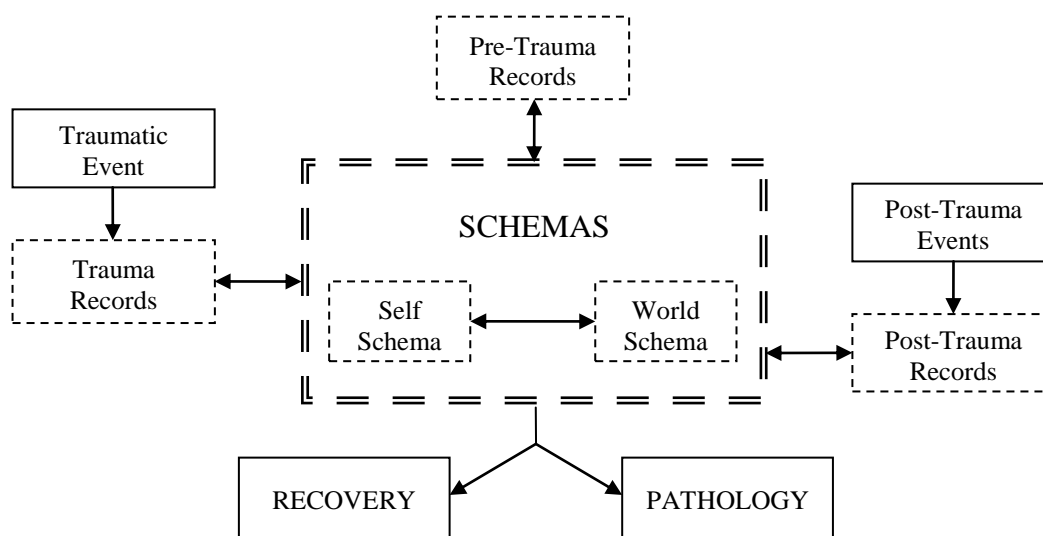
Emotional processing may also be hindered by what is recorded by the individual during the traumatic event (Foa & Rothbaum, 1998). As discussed earlier, fear structures contain stimulus, response, and meaning elements. It is posited that the fear structures underlying PTSD have a larger number of stimulus and response elements than other fear structures. The individual's pre-trauma schemas as well as the trauma itself affect the number of stimulus elements. When a large number of stimulus-danger associations exist, the individual is likely to perceive the world as entirely dangerous according to Foa and Rothbaum (1998). This

perception in turn leads to a greater number of physiological and behavioral response elements. Lastly, an individual may negatively interpret his or her emotional responses and behavior during the traumatic event. This can lead to the individual developing a negative view of him or herself (e.g., incompetent).

Post-trauma records (i.e., what is recorded after the traumatic event) is the final factor that can influence emotional processing. Foa and Rothbaum (1998) suggest that emotional processing can be hindered when the individual negatively interprets the reactions of others and his or her emotional difficulties/initial PTSD symptoms. These negative interpretations can again lead to the individual viewing the world as dangerous and him or herself as incompetent.

As mentioned, the three factors that influence the development of PTSD are suggested to be interrelated. Figure 1 provides an illustration of these interrelationships. Solid rectangles represent external events (i.e., trauma event, post-trauma events), while dashed-line rectangles represent the individual's representations in memory. According to Foa and Rothbaum (1998), what an individual records at the time of the trauma and the way he or she interprets trauma records are influenced by pre-trauma schemas. The manner in which post-trauma experiences are interpreted are influenced by both the individual's pre-trauma schemas and trauma records. Moreover, both the individual's trauma memory records as well as his or her schemas about the world and self are modified by his or her interpretations of post-trauma experiences.

Figure 1: Emotional processing of trauma (Foa & Rothbaum, 1998, p. 78)



Treatment

According to emotional processing theory, treatment involves helping the individual to emotionally process their trauma memories. Based on recent research suggesting that pathological associations in fear structures cannot be replaced or eliminated, Foa, Huppert, and Cahill (2006) have updated the theory's conceptualization of emotional processing. They suggest that emotional processing involves the creation of new non-pathological associations or alternatively, the creation of a new non-pathological fear structure. The original pathological ones, however, remain stored in the individual's memory and have the potential of being activated at a later time. Therefore, the aim of treatment is to increase the likelihood that the new association will be activated when stimuli are encountered in the natural environment. In order for the new non-pathological associations to have this advantage over the old pathological ones, Foa, Huppert, Cahill suggest that treatment take place in a variety of contexts.

Foa and Kozak (1986) propose that two conditions are required for there to be a reduction in fear through emotional processing: 1) the fear structure must be activated by fear-relevant information, and 2) new information, which is incompatible with the pathological elements of the existing fear structure, must be incorporated. According to Foa, Huppert, and Cahill (2006), there are a couple of important factors related to these two conditions. First, the level of activation is critical. There must be some activation of the fear structure, however, too

much is considered detrimental. They suggest that over-activation of the fear structure can lead to the individual being unable to process and incorporate new corrective information. This is because the over-activation inhibits the individual's attention. Second, merely activating the fear structure is suggested to be insufficient. Information disconfirming the pathological elements in the fear structure must be available and the individual must show proper engagement so that the new information can be incorporated. On the other hand, presence of information confirming the pathological elements may lead to the strengthening of the individual's pathological fear structure. Given these factors, Foa, Huppert, and Cahill posit that emotional processing occurs only when the individual manages to encode and incorporate the available disconfirmatory information into their existing knowledge.

Foa and colleagues (e.g., Foa et al., 2006; Rauch & Foa, 2006) suggest that exposure therapy be used to promote emotional processing. Exposure therapy provides the individual with exercises aimed at helping them to disconfirm pathological elements of the fear structure so that PTSD symptoms can be diminished. The exercises involve having the individual repeatedly confront avoided thoughts, situations, and activities through imaginal reliving and *in vivo* exposure.

Foa and Rothbaum (1998) outline seven mechanisms which operate in imaginal reliving. They propose that these mechanisms lead to the improvement of PTSD. First, repeated imaginal reliving is suggested to lead to habituation of fear, reduction in the anxiety that was associated with the trauma memory, and disconfirmation of the belief that anxiety will last forever. Second, confronting the trauma memory prevents the negative reinforcement of cognitive avoidance. Third, reliving exercises completed in a therapeutic environment allows safety information to be incorporated into the trauma memory. Fourth, prolonged focus on the trauma memory helps the individual to discriminate the event from other non-traumatic events and to see the traumatic event as a specific occurrence rather than confirmation that the world is completely dangerous and the self is totally incompetent. Fifth, imaginal reliving allows the individual to view their PTSD symptoms more positively and thereby correct his or her dysfunctional schema of self-incompetence. Sixth, focusing on the traumatic event in detail through repeated reliving allows the individual to modify negative self-evaluations. Seventh, repeated reliving allows the individual to develop a more organized memory record of the event. Foa and Rothbaum note that many of these mechanisms also operate in *in vivo* exposure. They additionally note that *in vivo* exposure specifically helps the individual

develop more realistic danger appraisals through confrontation with feared, but harmless, situations.

Prolonged exposure therapy is a specific exposure therapy program based on the tenets of emotional processing theory. The program typically involves 10 to 15 individual sessions. According to Foa, Hembree, and Rothbaum (2007), the program has four components:

- 1) Education about common trauma reactions and presentation of the overall rationale for the treatment
- 2) Training in calm and controlled breathing
- 3) Homework exercises involving *in vivo* exposure to avoided places, situations, or objects (they note that exercises that are especially difficult may be completed with the therapist)
- 4) Imaginal exposure to the trauma memories (conducted in therapy and as homework).

Foa and Rothbaum (1998) note that although many individuals benefit from prolonged exposure therapy alone, some may require additional cognitive-behavioral therapy techniques such as cognitive restructuring. They suggest that cognitive restructuring can better target negative thoughts and dysfunctional beliefs that produce feelings of guilt, shame, and anger. According to them, the central aim of cognitive restructuring is to identify and replace these thoughts and beliefs with more beneficial ones.

Foa, Chrestman, and Gilboa-Schechtman (2008) have revised the adult version of the prolonged exposure therapy program for use with adolescents. The program includes a therapist manual and an adolescent workbook. They note that many adolescent trauma survivors do not require treatment such as prolonged exposure as they are likely to recover naturally. For others, they note that prolonged exposure may not be appropriate. Therefore, they have outlined criteria to select appropriate candidates for the program. Among the criteria are the presence of PTSD symptoms for a time span of at least one month following the event and the ability to adequately visualize and describe the event.

Implications for school-based intervention programs

From the viewpoint of emotional processing theory, school-based intervention programs must help students emotionally process their trauma memories. The aim of the intervention must

be to help the students create new non-pathological associations. For this to happen successfully, two conditions must be met: 1) the fear structure must be activated and 2) new information must be incorporated into the fear structure. A variety of cognitive-behavioral therapy techniques can be used, however, exposure therapy is specifically recommended.

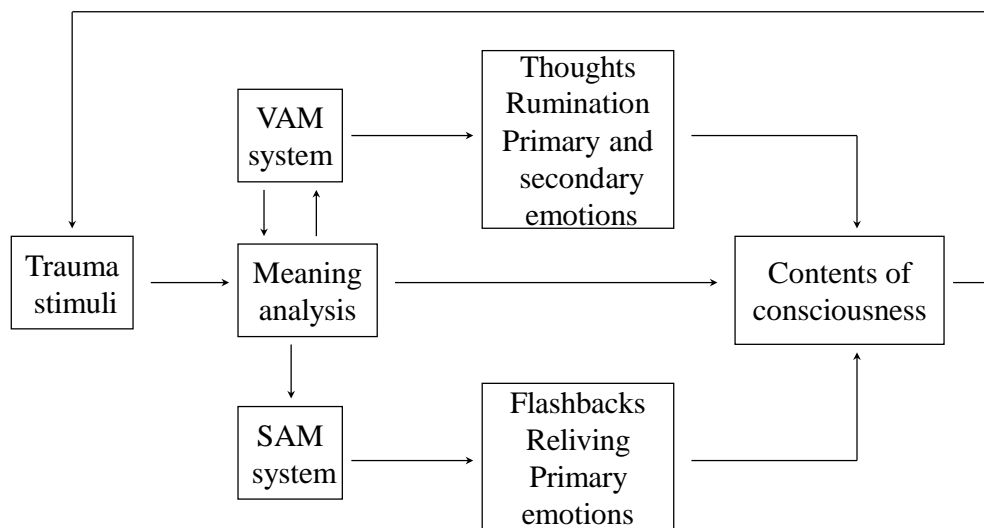
Empirical support

The findings from a number of research studies have supported some specific aspects of emotional processing theory. There is for example support for the hypothesis that activation of the fear structure is necessary for emotional processing (Foa et al., 2006; Rauch & Foa, 2006). There is also support for the hypothesis that individuals with PTSD have more severe negative cognitions about the world and self than other individuals and that recovery is associated with a reduction in these cognitions (Foa et al., 2006). Brewin and Holmes (2003) note that two aspects of the theory are quite well established by research. The first is the theory's proposal that rigid pre-trauma schemas serve as a risk factor for developing PTSD. The second is the theory's proposal that negative appraisals play a central role in the development and reinforcement of negative schemas. However, they note that the proposed mechanisms involved in PTSD improvement is one of several aspects of the theory not well established at this point in time. Regarding the treatment program based on emotional processing theory, prolonged exposure therapy, a large number of research studies have documented that it is effective in treating PTSD (Foa et al., 2007).

1.4.2 Dual representation theory

Brewin, Dalgeish and Joseph's (1996) version of dual representation theory was proposed as an attempt to reflect research findings regarding the characteristics observed in victims of trauma. The theory posits that traumatic experiences are encoded into two separate memory systems at the time of the trauma. One system stores the individual's conscious experience of the trauma, while the second stores the individual's non-conscious experience of the trauma. Although the two systems operate in parallel, one may dominate more than the other may at specific times (Brewin, 2003; Brewin & Holmes, 2003). Figure 2 provides an illustration of dual representation theory.

Figure 2: Dual representation model (Brewin, 2003, p. 109)



VAM

The term *verbally accessible memory* or VAM is used to refer to the system storing the individual's conscious experience of the trauma. Trauma memories stored in the VAM system are verbally available to the trauma victim and are integrated with the other autobiographical memories the individual has. Therefore, these memories can be communicated to others. The information contained in these memories is, however, limited because only what the individual consciously focused on before, during, and after the event is included (Brewin, 2003; Brewin & Holmes, 2003).

VAM memories contain some information regarding sensory details, as well as physical and emotional responses experienced during the event (Brewin et al., 1996). They also contain the individual's cognitive appraisals of the implications of the traumatic event both at the time of its occurrence and following. These appraisals lead to two types of emotions, *primary emotions* and *secondary emotions*. Primary emotions (e.g., fear and helplessness) result from the appraisals made at the time of the event while secondary emotions (e.g., hopelessness about the future) result from the appraisals made following the event (Brewin & Holmes, 2003).

SAM

The second system, which stores the individual's non-conscious experience of the trauma, is termed *situationally accessible memory* or SAM. SAM memories are quite different from those stored in the VAM system as they do not use a verbal code. Therefore, it is difficult for the individual to communicate these with others (Brewin & Holmes, 2003).

The information included in SAM memories cannot be retrieved in a deliberate manner. Instead, this information can only be retrieved when the individual is met with stimuli that are similar to the original trauma. Exposure to such stimuli can, for example, result in the individual experiencing flashbacks or trauma-specific dreams/emotions (Dalglish, 2004).

The information an individual stores in the SAM system is the result of lower level perceptual processing that occurred during the traumatic event. Therefore, the SAM system stores auditory and visual information as well as information regarding the individual's bodily responses that was not stored in the VAM system. Unlike VAM memories that are accompanied by both primary emotions and secondary emotions, SAM memories are accompanied only by primary emotions such as fear, helplessness, and horror (Brewin, 2003).

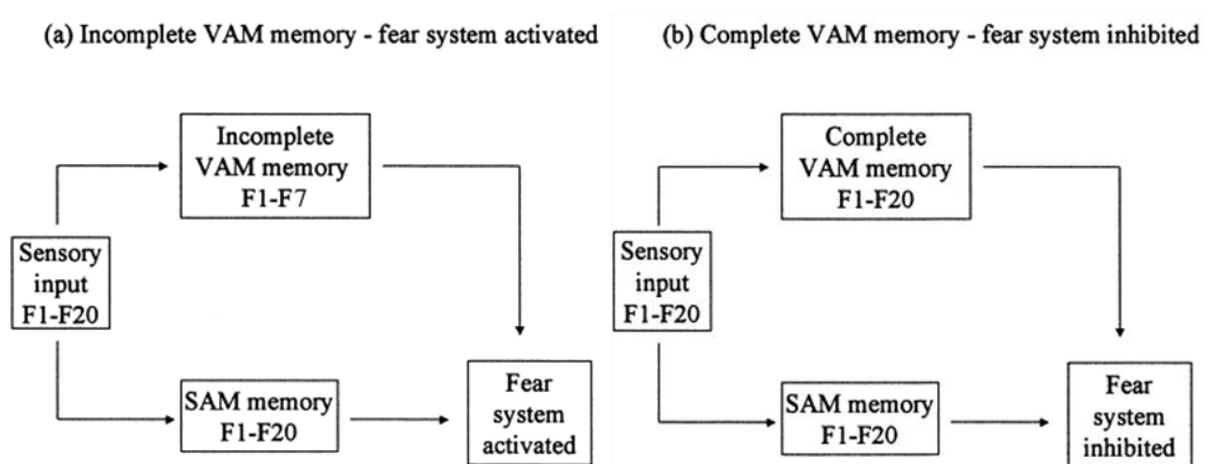
Trauma memory

Brewin (2001) posits that a trauma memory consists of a number of features. These features are represented as F1-F20 in his model (see figure 3). He suggests that the odds of the fear system being inhibited by a VAM memory increases as the number of features stored in the VAM system grows.

Illustration *a* in figure 3 demonstrates an example of a trauma memory in a typical beginning phase. Only a few features (F1-F7) of the trauma memory are stored in the VAM system at this point. If the individual is therefore faced with trauma reminders that correspond to features F1-F7, the fear system will most likely not be activated (Brewin, 2001). However, if the individual is faced with trauma reminders corresponding to any of the other features, the fear system is quite likely to be activated. This activation in turn leads to the individual experiencing a flashback (Brewin, 2001, 2003).

Illustration *b* in figure 3 demonstrates a trauma memory in which all the features stored in the SAM system have been transferred into the VAM system to create a complete VAM memory. According to Brewin (2001), this would theoretically permanently inhibit the fear system from becoming activated. He notes that in reality, however, this is not the case. This is due to fact that information stored in the SAM system is likely to remain more detailed than the information stored in the VAM system. Therefore, the fear system is still at risk of activation under very special conditions.

Figure 3: Incomplete and complete VAM memories (Brewin, 2001, p. 382)



Recovery

The theory posits that following a traumatic event, the trauma victim normally experiences a period of emotional processing. According to Brewin and his colleagues, this period can lead to three different types of outcomes for the individual (Brewin, 2001; Brewin et al., 1996). One of these outcomes represents successful recovery from trauma, while the two others represent unsuccessful forms of recovery from trauma.

Successful recovery

According to dual representation theory, SAM memories lead to vivid re-experiencing of the trauma and disturbing primary emotions such as fear and helplessness. However, these

memories are believed to be unalterable. Therefore, the theory assumes that recovery from trauma involves creating highly detailed VAM memories for the trauma information stored within the SAM system alone. The goal is to make these new VAM memories so easily accessible that the original SAM memories will be outcompeted when the individual is met with specific reminders of the traumatic event. It is posited that this will lead to fewer occurrences of vivid re-experiencing such as flashbacks and nightmares (Brewin, 2001, 2003).

According to Brewin (2001), flashbacks can serve an important role in transferring trauma information from the SAM system to the VAM system. However, this requires that the individual is able to focus consciously on the information contained in the flashbacks. It is assumed that repeated flashbacks are necessary to create VAM memories that contain enough detail to inhibit the fear system from becoming activated. Brewin suggests that the number of flashbacks required depends on two factors. The first factor rests on how much of the information was stored into the SAM system versus the VAM system at the time of the trauma. That is, fewer flashbacks are required when the VAM system is to a larger degree complete. The second factor rests on the individual's willingness to focus on and process the information contained in the flashbacks. Attempts to distract oneself from flashbacks are therefore considered detrimental to this process, while sustained attention is considered beneficial.

In addition to creating these new VAM memories, recovery from trauma is also believed to involve the individual regaining their sense of control as well as the reduction of negative secondary emotions resulting from the implications of the trauma (Brewin et al., 1996). This requires that the individual consciously integrates the trauma information with their preexisting knowledge structures through repeated re-processing (Brewin, 2001).

Unsuccessful recovery

Brewin et al. (1996) posit that two different forms of unsuccessful recovery from trauma can occur. The first is *chronic emotional processing*. This occurs when the individual is unable to avoid thinking about the trauma on a constant basis. Thoughts of the trauma and its implications dominate the individual's thinking. As a result, the individual is left with a feeling that he or she is constantly in harm's way. According to Brewin (2001), this form of

unsuccessful recovery is due to an inability on behalf of the individual to prevent trauma cues from triggering trauma memories that are located in the SAM system.

The second form of unsuccessful recovery is *premature inhibition of processing*. Brewin et al. (1996) explain that this occurs when an individual has repeatedly avoided thinking about the trauma in order to avoid the emotions connected to the trauma memories and the trauma's implications. In order to avoid unpleasant trauma memories and emotions, *avoidance schema* and *trauma-related scripts* are used. Avoidance schema results from the automatization of the strategies that the individual repeatedly used to avoid thinking about the trauma. Trauma-related scripts, on the other hand, are incorporated into the individual's VAM system according to Brewin et al. (1996). These scripts are created in such a way that they do not risk activating SAM memories and emotions. Despite the fact that avoidance schema and trauma-related scripts can help the individual avoid disturbing trauma memories and emotions, the trauma memories that have been left unprocessed are at risk of becoming reactivated at a later time.

Treatment

Dual representation theory does not prescribe a specific set of therapeutic procedures to treat posttraumatic stress disorder (Brewin & Holmes, 2003). However, treatment is seen to have two important tasks. The first is to help the individual reprocess SAM memories so that they can be stored properly in the VAM system as less emotionally laden memories. The theory postulates that when memories are stored additionally in the VAM system, the VAM version of the memories are more likely to be retrieved when the trauma victim is met with situational reminders of the trauma. Because of this *retrieval advantage*, flashbacks and other forms of re-experiencing are suppressed. This is due to the new VAMs inhibiting the activation of the fear system (Brewin & Holmes, 2003).

Exposure treatment is considered to be an appropriate treatment in order to help the individual create these new VAM memories (Brewin, 2003). However, the theory suggests that treatment may not need to focus on the entire trauma event in order to suppress flashbacks. Moments connected to very strong emotions, *hot spots*, can instead be identified and focused on in treatment. During exposure treatment, it is advised that the individual's

arousal levels be monitored. Arousal levels which are too high or low can be detrimental to the process of creating new VAM memories that are linked to the past (Brewin, 2001).

The second task of treatment is to help the individual to establish identities that are more positive. As postulated by the theory, cognitive appraisals are made during and following a traumatic event. These appraisals can lead to a number of negative emotions. Some are connected to the memories stored in the SAM system, while others are connected to the memories stored in the VAM system. However, the appraisals do not only lead to negative emotions. They can also challenge the individual's "very sense of self" (Brewin, 2003). Furthermore, these negative emotions and identities can interfere with the development of new VAM memories. Therefore, it is suggested that cognitive interventions be used to assist the individual in modifying their appraisals so that more positive identities and emotions will result (Brewin, 2001).

Implications for school-based intervention programs

School-based intervention programs must center on the two tasks of treatment discussed previously. For one, they must target the development of new VAM memories to block the undesirable SAM memories. Focus must be specifically placed on the students' memories of the traumatic event in order to help them reprocess these memories. For the other, programs must target improving the students' negative appraisals, emotions, and identities resulting from the traumatic event. To accomplish the two tasks, cognitive-behavioral therapy methods should be used.

Empirical support

According to Brewin and Holmes (2003), there is some empirical support for dual representation theory's assertion that trauma memories are represented in two different memory systems. They note for example that there is evidence suggesting that intrusive trauma memories are largely visuospatial (Brewin & Saunders, 2001) and that reliving experiences are based on lower level perceptual processing (Hellowell & Brewin, 2004).

According to Brewin (2005), a study by Holmes, Brewin, and Hennessy (2004) also provides evidence for dual representation theory. The study was two-part. In the first part of the study,

the participants in the experimental group watched a stressful film and executed a visuospatial task at the same time. The participants in the control group only watched the film. The researchers' hypothesis was that the SAM system would be disrupted by the execution of the visuospatial task. They hypothesized that this disruption would lead to an incomplete representation in the SAM system and therefore fewer involuntary memories. Compared with the control group, the experimental group did in fact demonstrate a significant decrease in involuntary memories according to Brewin. In the second part of the study, the participants in the experimental group watched a stressful film and executed a verbal task at the same time. The participants in the control group again only watched the film. Here, the hypothesis was that the VAM system would be disrupted by the execution of the verbal task. It was further hypothesized that this would lead to an increase in intrusive trauma memories, as the representation in the VAM system would not be complete enough to block the intrusive SAM memories. According to Brewin, the results did show a significant increase in involuntary memories in the experimental group as compared to the control group.

Dalgleish (2004) notes, however, that research designed to assess the validity of dual mental representations can be difficult to interpret definitively. In specific reference to the study by Holmes, Brewin, and Hennessy (2004), he suggests that although the data can be interpreted as supportive of two types of mental representations, it is equally supportive of a single mental representation (such as proposed by emotional processing theory).

1.4.3 Ehlers and Clark's cognitive model

Ehlers and Clark's (2000) cognitive model of PTSD focuses on the persistence of PTSD and explains why individuals with PTSD experience a sense of current threat despite the fact that the traumatic event has already taken place. They propose that two following reciprocal processes lead to the sense of current threat experienced by individuals with persistent PTSD:

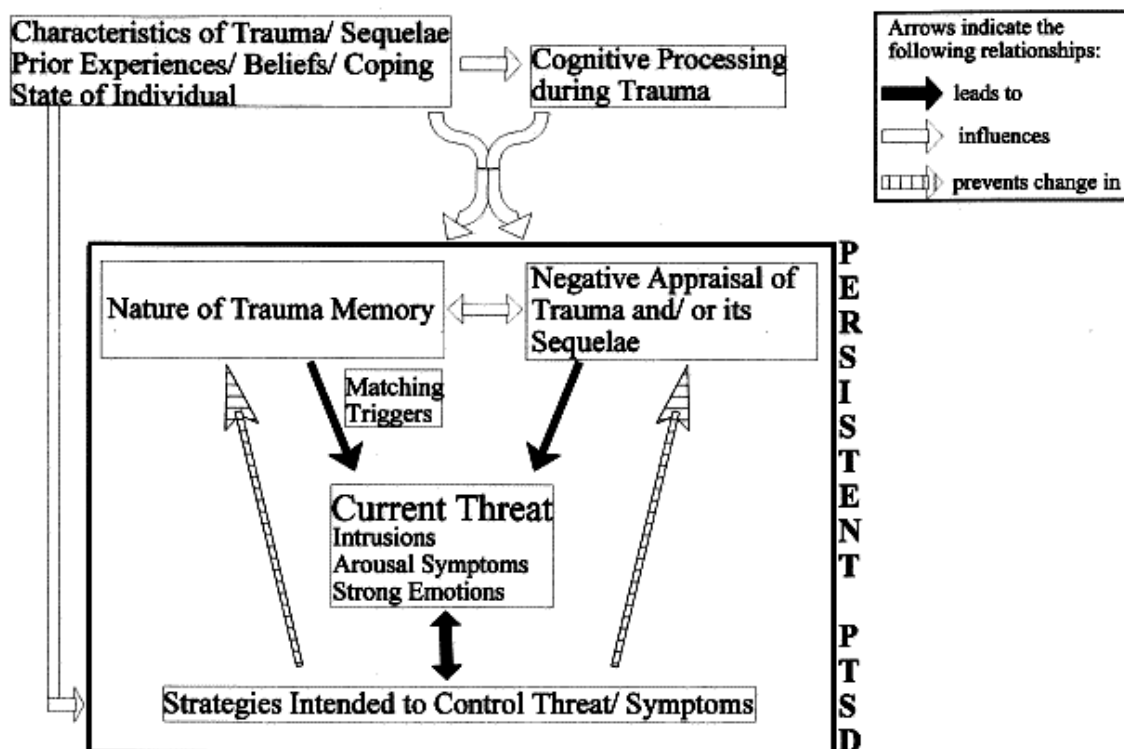
- 1) Negative appraisal of the trauma and/or its sequelae
- 2) Nature of the memory.

It is posited by Ehlers and Clark (2000) that the individual's cognitive processing at the time of the traumatic event influences both these processes. Thought processes at the time of the event affect the types of appraisals that will be made by the individual following the event. On the other hand, the manner in which information is encoded at the time of the trauma

affects the nature of the trauma memory itself. In similarity to Brewin et. al.'s dual representation theory (1996), Ehlers and Clark's cognitive model posits that trauma information is encoded through two different routes. They suggest that individuals who have a higher degree of data-driven processing (i.e., processing the sensory impressions from the event) rather than conceptual processing (i.e., processing the event in a meaningful and organized manner) are more prone to developing persistent PTSD. Figure 4 provides an illustration of the model.

According to Ehlers and Clark (2000), the sense of current threat that the individual experiences can be either external (e.g., threat to the feeling of physical safety) or internal (e.g., threat to self-image and future goals) in nature. As depicted by the model, current threat leads to symptoms of reliving such as intrusions, arousal symptoms, and strong emotions. In turn, the individual puts into play various behavioral and cognitive strategies to control these symptoms, emotions, and the threat itself. These strategies are, however, detrimental to recovery because they prevent the individual from making needed cognitive changes.

Figure 4: Ehlers and Clark's cognitive model (Ehlers & Clark, 2000, p. 321)



Negative appraisals

As mentioned, *negative appraisal of the trauma and/or its sequelae* is the first of the two reciprocal processes that lead to the sense of current threat. Negative appraisals are suggested to lead to a variety of negative consequences for the individual. The first appraisal type, *negative appraisal of the trauma*, can for example lead to overgeneralizations of the event to other activities. This results in the individual avoiding various everyday activities because he or she considers them to be dangerous. Additionally, negative appraisal of the trauma can lead to long-term implications for one's self-identity. This happens when the individual makes a negative appraisal of the way he or she reacted at the time of the event (Ehlers & Clark, 2000).

The second appraisal type, *negative appraisal of the trauma sequelae*, includes for example negative interpretations of initial PTSD symptoms and negative interpretations of others' reactions. Following a traumatic event, various symptoms are common. However, these symptoms can be interpreted by the trauma victim as abnormal or as threats to his or her well-being. Additionally, other people may respond in various ways to the individual in the aftermath of a traumatic event. If the responses of others are interpreted negatively, the trauma victim may avoid talking about the event. Symptoms such as social withdrawal may also result (Ehlers & Clark, 2000).

According to Ehlers and Clark (2000), a variety of emotional responses can be experienced by individuals with persistent PTSD. The types of appraisals made determine the types of emotional responses that will be experienced. For example, the emotional response of fear will be present if an appraisal involves perceived danger.

Nature of the trauma memory

The *nature of the trauma memory* is the second of the two reciprocal processes that lead to the sense of current threat. The way the trauma was encoded at the time of the event determines how it will be recalled. In the case of persistent PTSD, individuals have difficulty intentionally recalling the traumatic event in an organized and complete manner. At the same

time, however, they are subject to episodes of involuntary re-experiencing (e.g., flashbacks) (Ehlers & Clark, 2000).

Ehlers and Clark (2000) suggest that individuals with persistent PTSD have an autobiographical memory disturbance in relation to the traumatic event. Three factors play into this. First, the trauma memory is poorly integrated with other autobiographical memories. This poor integration is responsible for the individual's difficulty retrieving trauma information intentionally. It also results in the autobiographical memory knowledge base being weak or unable to inhibit the unintentional retrieval of trauma information when trauma cues are encountered. Second, the traumatic material has strong stimulus-stimulus (S-S) and stimulus-response (S-R) associations. Due to these strong associations, the individual is vulnerable to involuntary re-experiencing when associated stimuli are present in the environment. Finally, there is strong perceptual priming for temporally associated stimuli. This leaves the individual sensitive to perceptual stimuli similar to the traumatic event. When the individual is met with such stimuli, even those just vaguely similar, they are prone to involuntary re-experiencing.

According to Ehlers and Clark (2000), involuntary re-experiencing has some important characteristics. First, involuntary re-experiencing is largely sensory in its nature and the individual perceives the sensory impressions as if they are happening in the present. Second, the original emotions and sensory impressions from the time of the trauma are re-experienced by the individual. This occurs regardless of whether or not contradictory information was acquired at a later point in time. Third, *affect without recollection* can occur according to them. This refers to when an individual re-experiences physiological sensations and emotional responses without recollecting the traumatic event itself. Finally, a large number of stimuli and situations can trigger involuntary re-experiencing. Common cues are those that involve sensory details or emotional states that are similar to the original event.

Strategies intended to control threat/symptoms

As depicted by the model, individuals attempt to control perceived threat and PTSD symptoms by implementing various behavioral and cognitive strategies. According to Ehlers and Clark (2000), the specific strategies used are related to the individual's appraisals of the trauma and/or its sequelae as well as his or her notions of how best to cope. However, the

strategies used by individuals with persistent PTSD are considered maladaptive because they contribute to the maintenance of the disorder rather than to the recovery from it. Maladaptive strategies are suggested to maintain PTSD by the three following mechanisms:

- 1) Directly producing PTSD symptoms
- 2) Preventing change in negative appraisals and/or its sequelae
- 3) Preventing change in the nature of the trauma memory (Ehlers & Clark, 2000, p. 328).

In Ehlers and Clark's (2000) discussion of the model, several examples of maladaptive behavioral and cognitive strategies are provided. Thought suppression is provided as an example of a maladaptive strategy that directly produces PTSD symptoms. Here, intrusive trauma recollection increases as an individual tries to rid him or herself of unwanted thoughts about the trauma. Safety behaviors, on the other hand, serve as an example of a maladaptive strategy that prevents change in the appraisal of the traumatic event or its sequelae. They involve the individual putting into place preventative actions with the intention of reducing their risk of a future trauma. Therefore, the individual is left to believe that a traumatic event will occur should they stop applying these actions. An example of a maladaptive strategy that prevents change in the nature of the trauma memory is trying not to think about the event according to Ehlers and Clark. In this case, the individual may make huge efforts to occupy his or her mind with other thoughts in order to avoid the trauma memory. These efforts, however, prevent proper integration of the trauma memory into the individual's autobiographical knowledge base. Avoidance of reminders of the trauma (e.g., trauma site) is an example of a maladaptive strategy that can prevent change in negative appraisals as well as the nature of the trauma memory itself. By avoiding trauma reminders, the individual is unable to rectify incorrect appraisals that may exist. It is also detrimental to the development a more complete autobiographical memory of the event. Finally, Ehlers and Clark suggest that rumination (e.g., excessively thinking about how the event could have been prevented) can lead to maintenance of PTSD through all three of the mechanisms.

Treatment

Ehlers and Clark's (2000) cognitive model postulates that change must occur in three areas in order for an individual to recover from persistent PTSD. Firstly, the individual must elaborate and integrate the trauma memory into their autobiographical knowledge base. The purpose of

this is to reduce involuntary re-experiencing of the trauma. Secondly, negative appraisals that contribute to the maintenance of a sense of current threat must be modified. Finally, maladaptive behavioral and cognitive strategies that contribute to the maintenance of the disorder must be overcome. They suggest that a variety of cognitive-behavioral therapy methods can be used in order to produce these changes.

Building on the model, Ehlers and Clark (2008) have recently developed a trauma-focused cognitive-behavioral treatment program entitled *Cognitive Therapy (CT) for PTSD*. The three goals of the program relate directly to the three target areas of change outlined in the model.

The first goal is to “identify and change idiosyncratic negative appraisals (personal meanings) of the trauma and/or its sequelae” (Ehlers & Clark, 2008, p. 14). Techniques used for this purpose include providing information to the individual, using Socratic questioning, and implementing behavioral experiments. Ehlers and Clark suggest that work targeted at changing problematic appraisals must also include a focus on the trauma memory itself. This is because the negative appraisals often are a result of the individual’s memory of the trauma. They have developed a procedure known as *updating trauma memories* for this purpose. The procedure involves identifying and updating “hot spots” by using various techniques such as reliving and narrative writing.

The second goal is to “reduce re-experiencing by elaboration of the trauma memories and discrimination of triggers” (Ehlers & Clark, 2008, p. 14). Imaginal reliving, narrative writing, revisiting the trauma site, and discriminating triggers (in order to break links to the trauma memory) are the main techniques used to accomplish this goal. In addition, the *updating trauma memories* procedure is used to incorporate new information into the trauma memories.

Lastly, the third goal is to “drop dysfunctional behaviors and cognitive strategies” (Ehlers & Clark, 2008, p. 15). Ehlers and Clark state that this typically involves discussing the negative implications caused by the use of the strategy. Alternatively, a behavior experiment can be used to demonstrate the negative implications. After highlighting the negative implications, work is focused on helping the individual *drop* the strategy. They again suggest the use of a behavior experiment for this purpose.

Implications for school-based intervention programs

According to this model, school-based intervention programs must focus on the three target areas of change. That is, intervention programs must focus on helping students to elaborate and integrate their trauma memory with other autobiographical memories, change negative appraisals, and abandon maladaptive behavioral and cognitive strategies. In order to achieve these changes, the programs should use effective cognitive-behavioral therapy methods.

Empirical support

According to Ehlers and Clark (2008), the findings of several recent studies are consistent with the model. They highlight the three following areas:

- 1) There is support for the hypothesis that negative appraisals, of the trauma and its sequelae, along with maladaptive behaviors and cognitive strategies predict chronic PTSD.
- 2) There is support for the hypothesis that the nature of the trauma memory itself plays a role in the development of PTSD.
- 3) There is support for the hypothesis that individuals with PTSD have strong perceptual priming for trauma-related stimuli.

Ehlers and Clark (2008) also note that the cognitive-behavioral treatment program based on the model, *cognitive therapy (CT) for PTSD*, has been determined to be effective in treating PTSD. Brewin and Holmes (2003) agree that several aspects of the model are well supported by research. In particular, they note the model's proposals regarding the role negative appraisals and maladaptive strategies play in the development of the disorder. However, Brewin and Holmes also note that model's proposals regarding cognitive processing during trauma have little empirical support at present.

1.4.4 Summary of the theories

As can be seen from the overviews, the three theoretical perspectives conceptualize the development and maintenance of PTSD in various ways. However, they each suggest the use

of cognitive-behavioral therapy (CBT) methods in the treatment of the disorder. Emotional processing theory specifically recommends the use of exposure therapy, while dual representation theory and Ehlers and Clark's cognitive model recommend the use of general CBT methods.

Cognitive-behavioral therapy

In the 1960s and 1970s, Aaron Beck (1967, 1976) began formulating a cognitive therapy approach which included principles from behavioral therapy. Although Beck originally developed the approach for the treatment of depression, cognitive-behavioral therapy (CBT) has made a significant contribution to the treatment of anxiety disorders over the years (Rachman, 2009). Currently, it is one of the most researched types of psychotherapy and has been shown to be effective in relation to a wide spectrum of mental health disorders (A. T. Beck, 2005; Butler, Chapman, Forman, & Beck, 2006; Leichsenring, Hiller, Weissberg, & Leibing, 2006).

The CBT approach put forward by Aaron Beck is guided by Beck's cognitive model. Central to model is the notion that the individual's perceptions of events influences the emotions and behaviors he or she will have (J. S. Beck, 1995). The model proposes that "distorted or dysfunctional thinking" underlies all psychological disturbances. The goal of therapy therefore is to identify and modify such thinking (J. S. Beck, 1995). Treatment programs based on CBT for posttraumatic stress disorder use methods such as exposure therapy (imaginal or *in vivo*), cognitive restructuring, and anxiety management treatment. Additionally, some programs use a combination of methods such as anxiety management treatment along with exposure therapy (Foa & Meadows, 1997).

1.5 Objectives

There is information available in Norwegian educational literature regarding suggestions for teachers and other school personnel working with students who have experienced traumatic events. Examples include two recent books, *Krisepedagogikk* written by Raundalen and Schultz (2006) and *Beredskapsplan for skolen* written by Atle Dyregrov (2008). Despite this focus on the needs of students in national literature, an overview of school-based intervention

programs currently does not exist. Therefore, the purpose of this thesis was to develop such an overview. Based on this, the objectives were:

- 1) To identify school-based intervention programs for preventing or reducing symptoms of traumatic stress
- 2) To examine the effectiveness of the intervention programs in preventing or reducing symptoms of traumatic stress
- 3) To identify the accordance of the intervention programs with emotional processing theory, dual representation theory, and Ehlers and Clark's cognitive model.

2.0 Method

2.1 Introduction

The purpose of this thesis was to develop an up-to-date overview of school-based intervention programs targeted at preventing and reducing symptoms of traumatic stress. In order to do this, published research studies related to school-based intervention programs were compiled and reviewed.

In this chapter, the search methods used to obtain relevant research studies will be described first. This will be followed by a discussion of research design, validity, and effect size. Lastly, the criteria used for study selection will be presented.

2.2 Search methods used to obtain relevant research studies

Academic databases, websites, and reference lists from relevant review articles were used to identify potential studies for this thesis. The three main databases used were *ERIC*, *PsycINFO*, and *MEDLINE*. These databases were searched via the *EBSCOhost* online reference system. In addition to the three main databases, the *NREPP* online database was used to find specific intervention programs and *The Cochrane Database of Systematic Reviews* was used to search for systematic reviews. In order to obtain nationally published research studies, the *Bibsys Mime* online reference system was used to search the *Idunn* and *Norart* databases. In relation to websites, the following nationally based websites were reviewed: *Norwegian Centre for Violence and Traumatic Stress Studies (NKVTS)*, *Norwegian Directorate of Health*, and the *Norwegian Center for Crisis Psychology*. Additionally, the United States based *National Child Traumatic Stress Network* website was reviewed. The addresses for the internet resources used are provided in Appendix C. The review articles that were examined will be discussed in section 3.2.

ERIC, the Education Resources Information Center, is a service of the U.S. Institute of Education Sciences (IES) of the U.S. Department of Education. It provides access to education-related journal articles and other education-related materials. The database is updated with new records twice weekly and currently contains more than 1.2 million records. *PsycINFO* is a service of the American Psychological Association (APA). The database provides access to peer-reviewed journal articles and other literature related to behavioral science and mental health. The database is updated weekly and currently contains more than 2.6 million records. *Medline* is a service of U.S. National Library of Medicine (NLM). It

provides access to journal articles and other literature related to life sciences and biomedicine. This weekly updated database currently contains almost 11 million records from 7,300 different publications. *NREPP*, National Registry of Evidence-based Programs and Practices, is a service of the United States Substance Abuse and Mental Health Services Administration (SAMHSA). It is a searchable database of interventions for the prevention and treatment of mental and substance use disorders. *The Cochrane Database of Systematic Reviews* is a service provided by the Cochrane Collaboration. It provides access to systematic reviews of the effectiveness of health care interventions. The database is updated four times a year. *Idunn* is a national database for academic journal articles. It is a service of the Norwegian publisher Universitetsforlaget. The database contains full text articles from more than 40 journals from the following publishers: Universitetsforlaget, Gyldendal Akademisk, Samlaget, and Aschehoug. *Norart*, Norwegian and Nordic Index to Periodical Articles, is service of the National Library of Norway. This weekly updated database provides references to articles from 450 Norwegian as well some Nordic journals and annuals.

Given the considerable amount of research literature these different databases cover, it is assumed that the majority of published research studies related to school-based intervention programs for symptoms of traumatic stress should have been accessible through them. Therefore, these databases combined with the websites should have provided a good assemblage of research done on the topic.

2.2.1 Search terms and results

In order to find relevant studies in the databases, search terms related to the objectives of this thesis were used. The completed searches were limited to peer-reviewed articles. Table 1 provides an overview of these terms and their accompanying results. As can be seen in the table, some of the searches in the *PsycINFO* and *Medline* databases returned relatively large results. Therefore, search results of over 200 articles were narrowed by the use of age group limiters (i.e., 6-18 years). These narrowed results are presented in parentheses next to the original search results.

The abstracts related to each search were reviewed to determine which articles should be obtained for further inspection. Despite relatively large results in relation to some of the search terms used, many of the searches returned several of the same articles. Additionally, many articles were determined not to be relevant in relation to this thesis. Although

substantial effort was made to avoid bias, it is possible that relevant articles were overlooked due the selection being based on individual judgment. Therefore, the collection of articles used in this thesis cannot be assumed to be completely free of subjectivity.

Table 1: Search terms and results from Eric, PsycInfo, and Medline

Search terms		Results		
		Eric	PsycINFO	Medline
1	school intervention AND trauma	24	206(104)	919(387)
2	school intervention AND grief	10	74	90
3	school intervention AND traumatic stress	9	72	290(139)
4	school AND children AND intervention AND trauma	56	897(355)	699(581)
5	school AND adolescents AND intervention AND trauma	25	309(219)	119
6	school AND children AND intervention AND PTSD	19	242(130)	64
7	school AND adolescents AND intervention AND PTSD	12	102	31
8	school AND children AND intervention AND grief	23	292(96)	82
9	school AND adolescents AND intervention AND grief	12	89	20
10	school-based AND treatment AND trauma	6	59	490(188)
11	school-based AND treatment AND grief	2	17	20

Note: Data provided in parentheses denotes that age limiters were used to narrow the original search results.

2.3 Research design

A number of various standard research designs are used in research today. These designs provide the researcher with a general framework as to how a specific study should be planned and carried out. Standard research designs can broadly be classified as experimental or non-experimental (Gall, Gall, & Borg, 2007). Experimental research design is used to study causal relationships. The two main types of this design include randomized experimental design and quasi-experimental design. In both of these types of designs, the researcher

manipulates an independent variable(s) (e.g., treatment) in order to observe the effect that it has on a dependent variable(s) (e.g., symptoms of traumatic stress) (Lund, 1997). The manipulation of an independent variable or variables is a central feature of experimental research design. Non-experimental research design, on the other hand, does not involve any manipulation on the part of the researcher. Therefore, the focus of such research is to study phenomena as they are (Gall et al., 2007).

Correlational studies are an example of non-experimental design. In correlational studies, the goal is to identify the relationship between variables (Gall et al., 2007). Natural experiments are another type of non-experimental design. This research method is used in relation to naturally occurring events or situations (i.e., where it is not possible to manipulate variables). Here, the goal is to observe the effects of the event or situation (e.g., road traffic accident) on the dependent variable or variables (e.g., symptoms of traumatic stress) (L. Cohen, Morrison, & Manion, 2007).

As this thesis involves identifying the effects of school-based intervention programs, studies using experimental research design are most appropriate. Therefore, this type of design will be discussed in greater detail in the following section.

2.3.1 Experimental research design

As already mentioned, experimental research design is used to study causal relationships and involves the deliberate manipulation of independent variables. The studies reviewed in this thesis have studied the causal relationship between school-based intervention programs and symptoms of traumatic stress. Hence, the independent variable manipulated in these studies was the specific type of treatment provided.

Experimental research design typically involves two groups of subjects, one being the experimental group and the other being the control group. The experimental group receives the treatment under investigation while the control group does not receive this treatment. The control group can receive either an alternative treatment or no treatment at all. By using a control group, the researcher can better assess the effect of extraneous variables (Gall et al., 2007). In other words, it helps the researcher determine whether the results observed at the end of the study were most likely caused by the treatment variable itself or whether they were caused by other variables that were present. In addition to designs involving the use of two

groups, single group and multiple group designs are also commonly used in experimental research.

Randomized experimental design

Randomized experiments are often touted to be the gold standard for studying the effects of treatment (Shadish, Cook, & Campbell, 2002). Central to this form of research design is the random assignment of participants to both treatment and control groups. The goal is to make two or more groups that are initially as equal as possible. The use of random assignment strengthens the internal validity (will be defined in section 2.4.2) of a study (Lund, 1997).

Although randomized experiments are often seen as the preferred research method, it is not always practical or ethical to implement them. For example, it is not always possible to recruit enough participants in order to properly form equivalent groups through random assignment. Also, in some cases, it may be unethical to deny treatment to a group of subjects (Shadish et al., 2002).

Quasi-experimental design

Quasi-experimental design can be used when randomized experimental design is not possible. Lack of random assignment between experimental and control groups distinguishes quasi-experiments from randomized experiments (Gall et al., 2007). Quasi-experimental design includes designs with and without control groups. Therefore, a quasi-experiment can consist of a single group alone.

The internal validity of quasi-experiments is generally weaker than that found in randomized experiments (Lund, 1997). This is due to the lack of random assignment to control threats to internal validity. Therefore, the researcher must use other methods to reduce threats to internal validity. When quasi-experiments are designed well, they can provide useful information despite the lack of random assignment (Gall et al., 2007).

2.4 Validity

Assessing validity has to do with making a judgment about the degree to which inferences are supported by evidence (Shadish et al., 2002). Building on the work of Campbell and Stanley (1963), Cook and Campbell (1979) have developed a fourfold validity typology. They termed the four types *statistical conclusion validity*, *internal validity*, *construct validity*, and *external validity*. Each is related to the different kinds of inferences made by the researcher. The definitions of these four validity types have been reformulated by Shadish, Cook and Campbell (2002). Therefore, their formulations will be used as the basis for the following discussion.

Several factors can affect the validity of a study. These factors are referred to as *threats* by Shadish, Cook and Campbell (2002). Threats are possible reasons why inferences made by the researcher may be either partially or completely incorrect. Shadish et al. (2002) outline a number of threats in relation to each of the validity types. They note that these lists of threats help the researcher to anticipate and minimize threats by putting into place appropriate design controls. A discussion of all of the threat types is beyond the scope of this thesis. Therefore, only those that are most relevant will be discussed.

2.4.1 Statistical conclusion validity

Statistical conclusion validity refers to the validity of inferences about the correlation between the independent (treatment) variable and dependent (outcome) variable. Two related statistical inferences are involved. The first inference is whether the presumed independent and dependent variables in fact correlate with each other. The second inference is regarding the strength of the correlation between them (Shadish et al., 2002).

In relation to the first of the inferences, two types of errors can be made. These are termed Type I and Type II errors. A Type I error involves incorrectly concluding that correlation between the independent and dependent variables is present when in fact there is no correlation (Shadish et al., 2002). In relation to this type of error, the level of significance specified in a research article provides information about the level of “risk” the researcher was willing to take when the analyses were conducted. Researchers often choose a significance level of 5%. A 5% significance level indicates that there is a 5% chance that an established correlation is in fact artificial (Gall et al., 2007). A Type II error, on the other

hand, involves incorrectly concluding that correlation is not present when in fact there is correlation between the variables (Shadish et al., 2002). In order to reduce the risk of Type II error, statistical power analysis can be conducted (Gall et al., 2007).

Error can also be made in relation to the second inference. That is, the strength of the correlation can be overestimated or underestimated. Additionally, overestimation or underestimation can be made in relation to the level of confidence in the estimation of correlation strength (Shadish et al., 2002).

2.4.2 Internal validity

Internal validity refers to the validity of inferences about whether the relationship between the independent (treatment) variable and dependent (outcome) variable is causal. Three criteria must be demonstrated in order for an inference to be considered to possess internal validity. First, the independent variable must be shown to precede the dependent variable in time. Second, the independent and dependent variable must be shown to correlate. Third, it must be shown that no other plausible explanations exist for the observed correlation between the two variables (Shadish et al., 2002)

Shadish, Cook, and Campbell (2002) outline nine different types of internal validity threats, which they note are interrelated. In relation to the studies reviewed in this thesis, five of the threat types are particularly relevant. These are history, maturation, selection, attrition, and regression to the mean.

History

Non-planned events can occur during the course of an experimental treatment. History refers those that could have influenced the observed effect (Krauth, 2000). Many types of non-planned events can influence the outcome of an intervention program for traumatic stress. For example, teacher indifference or harshness towards students who have experienced a traumatic event could possibly lead to the observed effect being poorer than normal. Conversely, teacher warmth and supportiveness towards students could possibly lead to the observed effect being better than normal.

Maturation

Maturation refers to changes that are a result of the passing of time (Fraenkel & Wallen, 2003). Examples of this threat include changes due to the process of natural recovery (Maxwell & Delaney, 2004) or factors such as aging and experience (Fraenkel & Wallen, 2003). In relation to the studies reviewed in this thesis, maturation can pose a serious threat to internal validity. That is, positive changes in symptoms of traumatic stress may be the result of the natural recovery process or children/adolescents' natural cognitive development rather than the experimental treatment itself. According to Fraenkel and Wallen (2003), maturation threat can be reduced through the use of a control group which is "well-selected."

Selection

When treatment and control groups differ at the start of a study, the baseline differences can be responsible for the observed effect seen at the end of the study rather than the treatment itself. Selection can occur in quasi-experiments because of the fact that random assignment is not used. However, selection can also occur when random assignment is not properly implemented in randomized experiments (Shadish et al., 2002).

Attrition

Attrition refers to when subjects are lost during the course of a study. Subjects may be absent when data collection occurs or drop out of the study entirely. Attrition is also referred to as experimental mortality (Gall et al., 2007). In relation to intervention programs for symptoms of traumatic stress, a variety of factors can lead to subjects dropping out. For example, a child or adolescent may move to another area, become ill, or choose to quit because they fear being stigmatized by their peers if they to continue to participate.

Regression to the mean

Regression to the mean refers to the tendency of subjects with extreme scores on a pretest score to closer to the mean when tested subsequently (regardless of treatment). This can lead to researchers mistakenly attributing the change in scores to the experimental treatment.

Regression to the mean can occur when subjects are selected or select themselves to receive a treatment because they have high or low scores on a pretest (Shadish et al., 2002). Therefore, this threat can be quite relevant in relation to the studies reviewed in this thesis.

2.4.3 External validity

External validity refers to the validity of inferences about whether the causal relationship between the independent (treatment) variable and dependent (outcome) variable can be safely generalized to other populations, settings, treatment variables, and measurement variables (Shadish et al., 2002). An important criterion for inclusion of studies in this thesis was that they took place within a school setting. This was to better ensure the applicability of the intervention programs within Norwegian schools.

2.4.4 Construct validity

Construct validity refers to the degree to which inferences can be legitimately made from the operational variables in the study (i.e., observed persons, settings, treatments, and outcomes) to the constructs the operational variables represent (Shadish et al., 2002). In other words, this validity type has to do with whether the operational variables actually measure the constructs the study set out to measure. An operational variable is said to have good construct validity when it measures the relevant construct and not irrelevant constructs (Lund, 1997).

Shadish, Cook, and Campbell (2002) outline fourteen different types of construct validity threats. Five of the threat types are particularly relevant in relation to the studies reviewed in this thesis as they relate to the construct validity of outcomes and treatment. These five types are reactivity to the experimental situation, experimenter expectancies, novelty and disruption effects, compensatory rivalry, and resentful demoralization.

Reactivity to the experimental situation

Research subjects' perceptions of the experimental situation can affect the responses they make to the dependent variable. As a result, the treatment construct being tested by the researcher includes these perceptions (Shadish et al., 2002). For example, children and adolescents may perceive that complete recovery from symptoms of traumatic stress is expected and normal following participation in a treatment program. Therefore, they may respond in ways that make them appear psychologically healthy to the researchers.

Experimenter expectancies

The term experimenter expectancies refers to when the expectations an experimenter has about the experimental situation influences the treatment outcome. That is, the experimenter can unintentionally convey expectations to the subjects about desired responses despite trying to be objective (Shadish et al., 2002).

Novelty and disruption effects

Research participants may respond better due to fact that the experimental treatment because it is new to them. However, they may also respond poorly to the experimental treatment because it disrupts their normal routine. Such effects can wear off over a period of time (Gall et al., 2007). Shadish et al. (2002) note that "Hawthorne effect" is an example of this threat type. It refers to when improvement occurs because of the subjects receiving special attention.

Long-term reduction/elimination of symptoms of traumatic stress is a central aim of the studies reviewed in this thesis. Because of novelty and disruption effects, it is important that assessment occur not only at the end of treatment but again after an extended period of time to assess whether the experimental treatment leads to desired long-term changes.

Compensatory rivalry

Compensatory rivalry refers to when the control group performs better than usual because they see themselves as in competition with the experimental treatment group. This threat type is also referred to as the John Henry effect (Gall et al., 2007). The term is named after a steel worker who worked so hard that he outperformed a steam drill because he knew his productivity was being judged in relation to the drill. However, this unfortunately led to the worker passing away due to overexertion (Shadish et al., 2002).

Resentful demoralization

Resentful demoralization is the opposite response of compensatory rivalry. It refers to when the control group performs poorer than usual because they perceive that they are being denied a desirable treatment (Gall et al., 2007).

2.4.4.1 Double-blind strategy

In order to improve construct validity, the double-blind strategy can be used. This strategy involves ensuring that both the subjects and the experimenter who is in contact with them do not know what type of treatment (i.e., experimental treatment or alternative comparison treatment) is being provided (Krauth, 2000).

The use of a pretest-posttest double-blind control group design provides the researcher with good assurance that an observed change is the result of the experimental treatment. Essential to this, however, is that reliable instruments are used and that the subjects satisfactorily complete the experimental and comparison treatments (Bru, 1994).

2.5 Effect size

To determine the practical significance of a study, an effect size statistic can be used (Gall et al., 2007). Effect size allows for the results of various studies to be compared. There are a variety of types of effect size estimations (L. Cohen et al., 2007). Cohen's *d*, eta-squared (η^2), and partial eta-squared are examples of three different types.

In relation to the studies selected for this thesis, Cohen's d was calculated using the formula below when there was no effect size estimate provided. The ability to perform the calculations was, however, dependent on sufficient data in the articles. In order to expedite the process of calculating Cohen's d , the online calculator located at the following address was used: <http://web.uccs.edu/lbecker/Psy590/escal3.htm>.

$$\text{Cohen's } d = \frac{M_A - M_B}{\sqrt{\sigma_A^2 + \sigma_B^2}/2}$$

(J. Cohen, 1988, pp. 20, 44)

where

M_A = mean of group 1

M_B = mean of group 2

σ_A = standard deviation of group 1

σ_B = standard deviation of group 2

According to Jacob Cohen (1988), a Cohen's d effect size equaling .2 relates to a small effect size, .5 relates to a medium effect size, and .8 relates to a large effect size. Table 2 presents how he suggests these values correspond to eta-squared (i.e., proportion of the total variance that is attributed to an effect). In order to interpret the strength of partial eta-squared, Jacob Cohen's guidelines for eta-squared can be used according to Pallant (2007).

Table 2: Effect size

Size	Cohen's d	Eta-squared (η^2)
Small	.2	.010
Medium	.5	.059
Large	.8	.138

J. Cohen (1988, pp. 22-27)

2.6 Criteria used for study selection

In this thesis, six inclusionary criteria were used in order to select research studies:

- 1) The studies must have had at least one no-intervention or alternative intervention control group
- 2) The studies must have used randomized experimental design or quasi-experimental design
- 3) The studies must have taken place with children or adolescents within a primary or secondary school setting
- 4) The participants must have been exposed to a traumatic event
- 5) The main aim of the intervention must have been to prevent or reduce symptoms of traumatic stress
- 6) Standardized instruments (e.g., self-reports, structured interviews) must have been used to measure symptomatology and response to intervention.

In addition to the six inclusionary criteria, one exclusionary criterion was used:

- 7) The studies must not have primarily targeted Type II trauma such as those resulting from sexual abuse, physical abuse, or other forms of ongoing maltreatment.

3.0 Results

3.1 Introduction

A total of 82 published research studies were obtained for inspection following the use of the search methods presented in section 2.2. Several rounds of inspection were completed to sort through these studies using the inclusionary/exclusionary criteria for this thesis. In the first round, 34 studies were excluded because they did not take place in a school setting. The majority of these studies also met the single exclusionary criterion as they targeted children who had experienced repeated sexual abuse. In the second round, three studies were excluded because they targeted children or adolescents with Type II trauma. The third round led to the exclusion of 11 studies. These studies did not specifically aim to prevent or treat symptoms of traumatic stress. Here, the majority of the interventions were aimed at the resolution of grief or at improving emotional or behavioral problems, general mental health, or depression. In the fourth round, eight studies were excluded due to their research design (i.e., not randomized experimental or quasi-experimental) and lack of standardized instruments to measure symptomatology. The fifth and final round led to the exclusion of seven studies due lack of control group. As a result of these five inspection rounds, a total of 19 research studies were identified for inclusion.

In the remainder of this chapter, the review articles that were examined and the location of where the selected studies were conducted will be reported first. This will be followed by a general overview and narrative summaries of each of the 19 selected studies. For ease of reference, central details from each study are also provided in table form in Appendix D. Lastly, information regarding effect size estimations and the accordance of the programs with the three PTSD theories (presented in chapter one) will be reported.

3.2 Relevant review articles

As a result of the database searches, the 10 following review articles were obtained and determined to be relevant in relation to this thesis: Adler-Nevo and Manassis (2005), Hoagwood et al. (2007), Taylor and Chemtob (2004), Silverman et al. (2008), Brown (2005), Carr (2004), Pine and Cohen (2002), Cohen and Mannarino (2004), Cohen, Mannarino, Murray, & Igelman (2006), and Kruczek & Salsman (2006). Each of the articles relate to either intervention in the school setting for mental health issues or intervention in other settings (e.g., clinical settings) for children and adolescents who have experienced traumatic

events. The reference lists from each of these articles were examined for potential studies not found through the original database searches. There were very few new studies found through this process, however, the reference lists each contained one or two of the studies included in this thesis. In total, 8 of the 19 studies included in this thesis were listed in the reference lists of the 10 review articles. These studies are marked with a single asterisk in the table in Appendix D.

The article most relevant in relation to this thesis was the article written by Adler-Nevo and Manassis (2005). It is entitled "Psychosocial treatment of pediatric posttraumatic stress disorder: the neglected field of single-incident trauma." The authors present 10 studies related to the treatment of PTSD in children and adolescents following trauma. Three of the studies were targeted at trauma resulting from community violence. Two were targeted at trauma resulting from exposure to war. The remaining five were targeted at trauma resulting from single incidents such as natural disasters and motor vehicle accidents. Eight of the studies presented took place in schools. Six of these met the criteria for inclusion in this thesis. The two that were excluded lacked the use of a control group.

In addition to the 10 review articles, a technical report was also determined to be relevant. The report is entitled "How Schools Can Help Students Recover from Traumatic Experiences: A Tool Kit for Supporting Long-Term Recovery" and was written by Jaycox, Morse, Tanielian, and Stein (2006). It provides one-page descriptions of 24 different types of programs that can be used within the school setting for children and adolescents who have experienced traumatic events. However, the vast majority of the programs in the report have not been formally evaluated in published research studies. Although the report was not peer-reviewed, the reference list was examined. Examination of the reference list did not lead to identification of any new studies. However, seven of the studies contained in the reference list are included in this thesis.

3.3 Overview of the selected school-based studies

As can be seen in the table in Appendix D, the 19 studies selected for this thesis were conducted in 11 different countries. The countries included Indonesia (1), USA (6), UK (2), Italy (1), Lebanon (1), Israel (1), Turkey (1), Bosnia (2), Armenia (2), Taiwan (1), and Kosovo (1). School-based studies conducted in Norway were unfortunately not found.

The selected studies dealt with various types of trauma exposure. Eight of the studies dealt with exposure to a natural disaster (i.e., hurricanes/earthquakes), six dealt with exposure to war or political violence, two dealt with exposure to community violence, two dealt with exposure to terrorism and one dealt with exposure to a cruise ship sinking. The table also illustrates that a variety of instruments were used to measure symptomatology. The instruments are listed in abbreviated form within the table, with the complete names provided at end of the table.

As the majority of the articles lacked statements in regards to the theoretical foundations of the programs, it was not possible to organize the studies according to the three theories of PTSD discussed in chapter one. Therefore, the studies have been organized into four categories based on the main treatment approach used. The four categories are Cognitive-Behavioral Therapy (CBT), Play/Art/Drama, Eye Movement Desensitization and Reprocessing (EMDR), and Mind-Body Skills. The vast majority of the studies, 14 studies in all, used cognitive-behavioral therapy (CBT) methods as the main treatment approach. However, it should be noted that a number of the studies used multiple forms of treatment (e.g., CBT methods combined with art therapy). Therefore, the main treatment approach had to be inferred based on the information provided.

The following narrative summaries will provide a brief overview of each study. This will include information regarding the name of the program or manual, intervention components, participants, type of trauma exposure, findings, and limitations. The order each study is presented in is based on the name of the intervention program/manual (or the type of program).

3.3.1 Cognitive-Behavioral Therapy (CBT)

Tol, Komproe, Susanty, Jordans, Macy, and De Jong (2008) have studied the effectiveness of a school-based intervention known as “Classroom-Based Intervention (CBI).” The program was developed by the Center for Trauma Psychology in Boston to address the needs of children and adolescents exposed to threat and terror. Five main objectives underlie the program: 1) reduce the risk of maladaptation, 2) facilitate resiliency and return to normalcy, 3) facilitate empowerment and mastery, 4) use of a natural learning environment, and 5) screening for high-risk youth (Macy, Mary, Gross, & Brighton, 2003). The program is

manual-based and sessions include a combination of CBT techniques, cooperative play, and creative-expressive exercises (e.g., drama, dance, music). In this study, the Classroom-Based Intervention program was used with children and adolescents exposed to political violence in Indonesia. Fourteen schools participated in the study. Seven schools were randomized to the treatment group while the other seven were randomized to the waitlist control group. A total of 403 children and adolescents participated. Prior to enrollment in the study, all were screened for exposure to violent events, PTSD symptoms, and anxiety symptoms. The treatment group consisted of 182 participants (54.4% girls) and the control group consisted of 221 participants (43% girls). The children ranged from 7 to 15 years of age. The intervention program included 15 group sessions over a period of five weeks. There were approximately 15 students in each of the intervention groups. The program was delivered by adults (i.e., non-professional therapists) trained in the program. At the six-month follow-up, the treatment group was found to have significant improvement in PTSD symptoms compared to the control group ($p < .001$, Cohen's $d = .44$). The difference between the two groups in regards to hope was also significant ($p < .001$, Cohen's $d = .38$). This was due to the treatment group maintaining hope while the control group demonstrated a decrease in hope. There were no significant differences between the groups in relation to traumatic idioms, depressive symptoms, anxiety, and functioning scores at the six-month follow-up. Among the limitations of this study, the authors noted that the Depression Self-Rating Scale (DSRS) and SCARED-5 had low internal reliability. This made it difficult to determine whether the lack of change on these measures was due to the intervention or poor reliability. They also noted that the study's findings could have been biased by the fact that the assessors were not blind to treatment assignment. Therefore, this could threaten the construct validity of the study. In addition to these limitations, it is conceivable that the age range of the participants may have affected the results. The participants ranged in age from 7 to 15 years. Therefore, the youngest and oldest participants may have required different forms of intervention. It should also be noted that the groups did vary at baseline. This may have biased the sample somewhat. As mentioned, the treatment group had 54.4 percent girls while the control group had 43 percent girls. In addition, the treatment group was on average four months older than the control group and the waitlist group had more displacement (i.e., fewer living in original village). Despite these differences, there were no significant differences found between the groups on all of the exposure and outcome measures at baseline, except for aggression.

Stein, Jaycox, Kataoka, Wong, Tu, Elliott, and Fink (2003) have investigated the efficacy of a school-based intervention named “Cognitive-Behavioral Intervention for Trauma in Schools (CBITS).” This manual-based program was designed to address symptoms of PTSD, anxiety, and depression among inner-city children and adolescents exposed to violence. Sessions are based on CBT techniques (i.e., cognitive therapy, exposure, problem solving). In this study, the intervention consisted of 1 individual session and 10 group sessions delivered by school psychiatric social workers trained in the program. The individual session involved the use of imaginal exposure, while the group sessions involved the use of didactic presentation and age-appropriate examples, games and worksheets. There were five to eight children in each intervention group. A total of 126 children exposed to community violence in Los Angeles, California participated in the study. All of the participants had PTSD symptoms in the clinical range at enrollment. The mean age of the participants was 11 years and all were in the sixth grade. The early intervention group had 61 participants (54% girls) and the delayed intervention control group had 65 participants (58% girls). Assignment to the early intervention group and delayed intervention group was done randomly. At baseline, there were no significant differences found between the groups. After three months of intervention, the early intervention group had significantly lower scores in relation to symptoms of PTSD (Cohen’s $d= 1.08$), depression (Cohen’s $d= .45$), and psychosocial dysfunction (Cohen’s $d= .77$) as compared to delayed intervention group. There were no significant differences between the groups after both had received intervention at six months. The authors noted that a longer follow-up period and the use of an alternative intervention control group would strengthen future studies of the CBITS program. In relation to limitations, they noted the lack of blinding may have biased the intervention or assessments.

Kataoka, Stein, Jaycox, Wong, Escudero, Tu, Zaragoza, and Fink (2003) have examined the effectiveness of a school-based intervention named “Mental Health for Immigrants Program (MHIP).” The program is based on the Cognitive-Behavioral Intervention for Trauma in Schools (CBITS) program. MHIP’s aim is to address the needs of Latino immigrant children and adolescents exposed to community violence. This study was conducted in nine public schools in Los Angeles, California. The manual-based intervention consisted of eight group sessions of CBT and one individual session of imaginal exposure. There were five to eight children/adolescents in each intervention group. Didactic presentation and age-appropriate examples, games, and worksheets were used in the group

sessions. In addition to the child/adolescent intervention, four 2-hour multifamily group sessions were offered to parents. Participation in these sessions was optional. Master's level school psychiatric social workers trained in the program delivered the group, individual, and multifamily sessions in Spanish. A total of 198 immigrant children and adolescents (50% female) with PTSD and/or depression symptoms in the clinical range participated in the study. The intervention group had 152 children and adolescents while the waitlist control group had 46 children and adolescents. The participants were in the third to eighth grades at the time of the study. Their mean age was 11 years. At the three-month follow-up, the intervention group had significantly lower scores in relation to symptoms of PTSD ($p < .05$) and depression ($p < .01$) compared to waitlist control group. Despite lower scores in the intervention group, symptoms remained in the clinical range on average. In relation to future studies of the program, the authors suggest that modifications be made to the intervention (e.g., longer treatment period, booster sessions) to determine if outcomes can be further improved. They also suggest the use of an alternative intervention control group for comparison purposes. Regarding the limitations of the study, the authors noted the lack of randomization of all the participants, modest symptom changes at follow-up, and larger dropout among older participants. In relation to the older participants, they noted that the larger dropout may possibly be due to either age or the program's format. In addition to the authors' limitations, it should be noted that the study lacked the use of a long-term follow-up. An additional follow-up at a later point in time (e.g., after 1 year) would have provided valuable information as to whether the symptom reduction was maintained. It also should be noted that although all of the instruments used were translated into Spanish, they had not been validated with Latino immigrant children (strictly speaking, it is not the instruments themselves that have validity but rather the scores that are obtained by using the instruments).

Yule (1992) has studied the effects of a school-based intervention to target anxiety, avoidance, and intrusive thoughts. The intervention involved the use of a debriefing meeting and group sessions using cognitive-behavioral therapy methods. The intervention was not named nor was it manual-based. There were a total of 39 adolescent girls who participated in the study. Two British girls' schools served as the treatment and control groups. All of the girls were survivors of a cruise ship sinking. There was no screening or baseline testing completed prior to enrollment or the intervention period. A total of 24 girls received treatment while 15 received no treatment. Those who participated in the intervention group

ranged in age from approximately 14 to 16 years. The intervention was delivered in two small groups by the researchers (i.e., mental health professionals). At five to nine months post-disaster, the intervention group had significantly lower intrusion and avoidance scores on the Impact of Events Scale ($p < .01$) as well as significantly lower overall fears on the Fear Survey Schedule ($p < .05$) compared to the control group. However, anxiety and depression scores were only slightly lower in the intervention group compared to the control group. The author did not note any limitations to this study. However, it is reasonable to conclude that lack of screening prior to enrollment/intervention, lack of randomization, and lack of blind assessors are among the study's limitations. In addition, questions can be raised in relation to the construct validity of the study. This is due to the fact that the study's researchers both led the intervention sessions and assessed the participants. Therefore, expectations may have unintentionally been conveyed to the participants. Finally, it is also reasonable to conclude that the statistical conclusion validity of this study may be threatened. The groups in this study were small (experimental group $n = 24$, control group $n = 15$), yet a parametric test (t-test) was applied to investigate the mean differences in PTSD symptoms. Given the fact that the group sizes were so small, the criteria for using parametric tests may have been violated thereby threatening statistical conclusion validity. Therefore, the results must be interpreted very cautiously.

Karam, Fayyad, Karam, Tabet, Melhem, Mneimneh, and Dimassi (2008) have studied the efficacy of a classroom-based intervention program designed for children and adolescents after war. No name was specified for the program or the manual used. The program involves the use of cognitive-behavioral strategies along with stress inoculation training. Among the various strategies employed are cognitive restructuring, problem solving, drawing, role-playing, writing, and group discussion. In this study, teachers trained in the program delivered the manual-based intervention over 12 consecutive school days. Each session lasted one hour. A total of 2500 children and adolescents from six schools in southern Lebanon received the classroom-based intervention post-war. All of the children and adolescents in these schools received the intervention shortly after the end of the war. Of the 2500 children and adolescents, 101 (51.5% male) were randomly selected to form the study's treatment group. The control group consisted of 93 children and adolescents (50.5% male) from schools where the intervention did not take place. The children and adolescents in the two groups were matched according to age, gender, and degree of exposure. Ages of the study's

participants ranged from 6 to 18 years. The mean age for the treatment group was 11.7 years and the mean age for the control group was 11.8 years. At the one-year post-war follow-up, no treatment effect was found. There were no significant differences between the intervention and control group in relation to major depressive disorder, separation anxiety disorder, and posttraumatic stress disorder. The authors noted that the findings indicate that immediate intervention following a traumatic event may not be advisable. They suggest that it may be better to provide intervention a few months after the traumatic event and to provide screening to identify those in need of intervention. Among the main limitations noted by the authors were: 1) lack of randomization, 2) use of teachers with no mental health background (and whose mental states were possibly affected by the war), 3) lack of earlier outcome measurement to identify short-term effects of the intervention, and 4) lack of child and parent self-rating scales. In addition to these limitations, the study used the DICA-R to measure symptomatology. It was stated in the article that the instrument had been adapted to Arabic but it was not stated whether this measure had been validated with Lebanese children and adolescents prior to the study. Therefore, the use of this instrument may have affected the results that were obtained. Furthermore, the inclusion of participants with mild initial symptoms of PTSD may have made it difficult to detect improvements and thereby minimized the effects of the treatment (Foa & Meadows, 1997). Another potential limitation that may have affected the results was the wide age range (6-18 years) of the participants. The authors noted that the intervention program's techniques were adapted to the participants' developmental level. However, no treatment effect was found in this study. Therefore, it is conceivable that the adaptations to the intervention program were not enough to meet the needs of the different age groups.

Berger, Pat-Horenczyk, and Gelkopf (2007) have examined the effectiveness of a classroom-based intervention program named "Overshadowing the Threat of Terrorism (OTT)." The intervention was designed as a universal program to help children cope with exposure to terrorism and threat. It is a manual-based program that involves the use of cognitive-behavioral methods, art therapy techniques, body-oriented strategies, and narrative approaches. The study's intervention group consisted of 70 children (55.7% male) from 5 classes. The waitlist control group consisted of 72 children (52.8% male) from a different set of five classes. All of the study's participants attended the same public school located in Hadera, Israel. Hadera had experienced five terror attacks during the 30 months prior to the

study. In addition, the school was 25-meters from the site of two of these attacks (suicide bombings). At the time of the study, the participants were in the second to sixth grades and were 7 to 11 years old. The children in the intervention group received a total of eight 90-minute intervention sessions delivered by their homeroom teachers. The teachers were trained prior to the start of the intervention. At the two-month follow-up, the intervention group had significant reductions in PTSD symptoms ($p < .001$), somatic complaints ($p < .001$), separation anxiety and general anxiety ($p < .001$) as compared to control group. The authors noted that the study had the following weaknesses: 1) low parental consent rate (46.6%) which may have biased the sample; 2) lack of placebo/alternative treatment comparison group; and 3) lack of long-term follow-up. In addition to these weaknesses, it is reasonable to question whether the construct validity of this study was threatened. Specifically, it is possible that resentful demoralization may have occurred as the intervention classes and control classes were located at the same school. In the study, the children in the intervention classes received the active intervention while the control classes continued participating in their regular social studies classes. Therefore, it is possible that the control classes may have performed poorer due to the fact that they were aware their peers in the intervention classes received something that they were denied. In relation to age, it should be noted that the younger classes were found have a significantly greater reduction in symptoms of PTSD, somatic complaints, and separation anxiety following intervention than the older classes. Therefore, it is conceivable that a different form of intervention may have been more effective with the older classes.

Brown, McQuaid, Farina, Ali, and Winnick-Gelles (2006) have investigated the efficacy of a school-based intervention program designed for children exposed to a terror attack. The intervention program is a two-step CBT program. The first step is a manualized 10-session classroom intervention and the second step is a six session individual intervention. The manual for step one is entitled *Preventing Adverse Reactions to Negative Events and Related Stressors (PARTNERS): A cognitive behavioral intervention for children exposed to stressful events. School-based intervention* (Brown & Farina, 2003). The name of the entire intervention program was not specified. Step one of the program involves psycho-education, controlled breathing, progressive muscle relaxation, cognitive restructuring, positive imagery, anger management, and developing a safety plan. Step two involves four sessions of imaginal exposure in addition to individualized review of the skills presented in the classroom intervention (step one). The participants in this particular study had all attended a school that

was in close proximity to the World Trade Center attacks in USA on September 11th, 2001. A clinical social worker delivered both the classroom intervention and the individual intervention. As there was no control group used for the step one portion of the intervention, all data and findings for this step are excluded from this summary. A total of 59 children (54% male) from five classes in a charter school participated in the step two portion of the study. The children ranged in age from 8 to 13 years and were in the third to seventh grades. For step two, the treatment group consisted of 18 children who received the individual intervention. These children met criteria for PTSD prior to the start of the individual intervention. The control group consisted of 41 children who did not receive the individual intervention and did not meet criteria for PTSD. In relation to step two, there was significant time by group interaction for Child PTSD Symptom Scale total ($p = .004$, $\eta^2 = .14$), re-experiencing ($p = .045$, $\eta^2 = .07$), and avoidance ($p = .005$, $\eta^2 = .13$). From pre-individual intervention to post-individual intervention, there were significant decreases in re-experiencing, avoidance, and total symptoms in the treatment group (i.e., children who had met PTSD criteria). There were no significant changes found in the control group (i.e., children who had not met PTSD criteria). The authors noted small sample size and the use of non-equivalent groups among the limitations in the step two portion of the study. In addition to these limitations, it is conceivable that the age range of the participants may have affected the results somewhat. The participants ranged in age from 8 to 13 years. However, all of the participants received the same form of intervention. It is therefore reasonable to question whether the youngest and oldest participants may have benefited from different forms of intervention. It is also possible that the statistical conclusion validity of this study was threatened. Despite the fact that the experimental group was quite small ($n = 18$), a parametric test (i.e., ANOVA) was applied to investigate the outcome of the individualized intervention. Therefore, the results must be interpreted cautiously.

Salloum and Overstreet (2008) have evaluated the efficacy of a school-based intervention named “Project LAST (Loss and Survival Team).” The intervention is manual-based and uses a combination of cognitive-behavioral therapy and narrative therapy techniques. In this particular study, the intervention was provided to children in New Orleans, Louisiana following Hurricane Katrina. Fifty-six children (62.5% male) with moderate to severe levels of symptoms of PTSD were assigned to either individual therapy ($n = 28$) or group therapy (n

= 28). Assignment was random and both therapy modalities used the Project LAST program. The PTSD symptoms the children in the sample were experiencing were due to hurricane-related stressors and/or the loss of a loved one. The children ranged in age from 7 to 12 years and were in the second to sixth grades. Intervention was delivered during school to 13 of the children and after school to 43 of the children. A total of 10 (approximately one-hour) sessions were provided to the participants over a period of 10 weeks. The children who participated in the group therapy had one session of individual therapy to discuss difficult memories and address specific issues (e.g., guilt) related to trauma and/or loss. The group therapy modality had five to six children in each group. Master's level social workers delivered both of the intervention modalities. A total of 45 children were administered the post-assessment and follow-up. At pre-assessment, there were no significant differences between the groups on all the measures of symptomatology. From pre-assessment to the three-week follow-up, there were significant decreases in symptoms of PTSD ($p = .001$, Cohen's $d = 1.82$), depression ($p = .001$, Cohen's $d = 1.11$), traumatic grief ($p = .001$, Cohen's $d = 1.13$), and global distress ($p = .006$, Cohen's $d = .60$). There were no significant differences found between the group and individual intervention. The authors noted that the findings suggest that the intervention may be effective regardless of whether it is delivered in a group format or on an individual basis. Regarding limitations, they noted the following: 1) lack of a longer period of follow-up, 2) lack of parent or teacher reports of functioning, and 3) lack of an alternative treatment comparison group. In addition to the limitations noted by the authors, it is important to note that the sample may be biased by a low parental consent rate (35%). It is also important to note that treatment effectiveness was found to vary between the youngest and oldest children. The children in the 7 to 9 year old age group had higher traumatic grief scores at posttest as compared to the 10 to 12 year old age group. Additionally, the girls in the 7 to 9 year old age group had higher PTSD symptom scores at posttest.

Wolmer, Laor, Dedeoglu, Siev, and Yazgan (2005) have studied the effectiveness of a classroom-based intervention named "School Reactivation Program." The program involves the use of psycho-education modules, cognitive-behavioral techniques, play activities, and personal diaries. This particular study is a three-year follow-up of the children who participated in the intervention program following a devastating earthquake in Turkey. An earlier study was conducted with these children to measure their pre and post-intervention symptomatology (see Wolmer, Laor, & Yazgan, 2003), but was excluded from this thesis due

to the lack of a control group. Teachers trained in the program conducted the intervention sessions within the classroom setting. All of the children in the classes participated. At the time of the intervention, the children were in grades one to five (mean age 8.83 years). Over a period of four weeks, eight two-hour sessions of intervention were provided. A total of 287 children and adolescents from three schools in the disaster area participated in the follow-up study. At this time, the mean age of the participating children was 11.5 years. The intervention group consisted of 67 children and adolescents (60.6% girls) who had received the classroom-based intervention. The control group consisted of 220 children and adolescents (51.4% girls) who had not received the intervention. At the three year follow-up, the intervention group had significant decreases in symptoms of posttraumatic stress ($p < .02$), grief ($p < .001$), and dissociation ($p < .001$) compared to the post-intervention assessment. As compared to the control group, there were no significant differences in relation to symptomatology at follow-up. However, teachers rated children in intervention group significantly higher than the control group in relation to academic performance ($p < .003$), social behavior ($p < .05$) and general conduct ($p < .008$). The main limitation noted by the authors is in regard to the sample. In relation to the intervention group, only 33% of the children who participated in the first study were located for the three-year follow-up. This was due to massive relocation following the disaster. The control group, on the other hand, did not participate in the first study. Therefore, clinical information regarding this group from the time the intervention took place was not available to the researchers. Another potential limitation that may have affected the results was the age range of the participants. At the time of the intervention, the participants were in the first to fifth grades. However, all of the participants in the intervention group received the same intervention. As no treatment effect was found in relation to symptomatology, it is conceivable that the participants required different forms of intervention based on their age.

Ehnholt, Smith, and Yule (2005) investigated the efficacy of a school-based intervention program. The manual for the program is entitled *Children and War: Teaching Recovery Techniques* (Smith et al., 2000) and was written for the Children and War Foundation based in Bergen, Norway (see www.childrenandwar.org). The manual is designed such that adults without professional mental health training can implement the group intervention sessions with children and adolescents. The program is based on cognitive-behavioral therapy and aims to help children deal with symptoms of intrusion, arousal, and avoidance. Examples of

the psycho-social-educational activities used include imagery techniques, dual attention techniques (similar to EMDR), breathing techniques, progressive muscle relaxation, and coping self-statements. Group discussions, drawing, writing, and homework activities are also used. In this study, the intervention was implemented in two London schools with children and adolescents who were refugees or asylum-seekers from war-affected countries. The participants were referred by their teachers due to exposure to traumatic events and concerns about their emotional well-being. The intervention was delivered by a clinical psychology trainee in groups of up to eight children in small classrooms. Intervention sessions were one-hour long and occurred once a week over a course of six weeks. A total of 26 children and adolescents (65% male) participated in the intervention. Of these children, 24 scored above the cut-off for PTSD diagnosis. There were 15 participants assigned to the early intervention group and 11 assigned to the waitlist control group. The participants ranged in age from 11 to 15 years. The mean age for the early intervention group was 12.47 years and the mean age for the waitlist control group was 13.46 years. At post-intervention, the immediate intervention group had significantly lower scores in relation to PTSD symptoms ($p = .003$) and anxiety symptoms ($p = .018$) compared to control group. At the follow-up two months later, only 8 of the 15 participants from the intervention group were available. The reduction in PTSD symptoms was not maintained in this intervention group subset. However, there were slight decreases found from the pre-intervention assessment to the two-month follow-up assessment in relation to depression and anxiety. However, these were statistically non-significant. The authors noted that a flare up of violence in Macedonia occurring at the time of the two-month follow-up likely caused the return of PTSD symptoms in the intervention group. Seven of the eight children and adolescents who participated in the two-month follow-up were from Kosovo and had many family members and friends living in Macedonia. Among the limitations noted by the authors were: 1) small sample and loss of participants at follow-up, 2) lack of random assignment to groups, 3) questionnaire-based self-reports rather than interviews to measure outcomes, and 4) measures based on British and American normative data. In addition to these limitations, it should be noted that parametric tests were used despite the fact that the groups were small (early intervention group $n = 15$, waitlist control group $n = 11$). The use of parametric tests with such small groups threatens the statistical conclusion validity of the study. However, non-parametric tests were applied in cases where data were skewed. This application should therefore strengthen the study's statistical conclusion validity.

Layne, Saltzman, Poppleton, Burlingame, Pasalic, Durakovic, Music, Campara, Dapo, Arslanagic, Steinberg, and Pynoos (2008) have investigated the effectiveness of a group-based manualized intervention program known as “Trauma and Grief Component Therapy for Adolescents (TGCT).” The program was formerly known as “UCLA School-Based Trauma/Grief-Focused Group Psychotherapy” (Saltzman, Steinberg, Layne, Aisenberg, & Pynoos, 2001). The three studies to follow have also evaluated versions of the program. The Trauma and Grief Component Therapy for Adolescents (TGCT)/ UCLA School-Based Trauma/Grief-Focused Group Psychotherapy program is based on Pynoos, Steinberg, and Wraith’s (1995) developmental model of childhood traumatic stress. The five therapeutic foci that guide the program include addressing the traumatic experience and trauma/loss related symptoms, trauma and loss reminders, interplay between trauma and grief, secondary adversities, and developmental impact. The program is organized into the four following modules:

- 1) Psycho-education and anxiety management skills (e.g., breathing exercises, muscle relaxation techniques, safe-place imagery)
- 2) Trauma narrative construction and exposure (i.e., working through traumatic experiences)
- 3) Traumatic bereavement (e.g., psycho-education, guided imagery, coping strategies)
- 4) Resumption of the developmental progression (e.g., problem-solving, making plans for the future, reengaging in activities) (Saltzman et al., 2001).

In this study, the program was implemented in 10 secondary schools in Bosnia following war. The treatment group received group-based TGCT intervention plus classroom-based intervention while the comparison group received classroom-based intervention alone. The classroom-based intervention consisted of psycho-education and skills intervention based on TGCT while the group-based intervention consisted of a more intensive version of TGCT psychotherapy. A total of 127 war-exposed adolescents with severe symptoms of PTSD, depression, and/or grief participated in the intervention. There were 66 participants (63% female) randomly assigned to the treatment condition and 61 (66% female) randomly assigned to the comparison condition. The participants ranged in age from 13 to 19 years. The classroom-based intervention and group-based intervention sessions were delivered by

school counselors trained in the program. The classroom-based intervention sessions took place throughout the course of one school year. The 17 to 20 group-based intervention sessions took place over a course of six-months. These sessions lasted 60 to 90 minutes. A total of 6 to 10 adolescents participated in each group. In addition to the group sessions, a pre-group interview was held with each of the treatment group participants. At post-intervention, the treatment group had significant reductions in symptoms of PTSD ($p < .001$, Cohen's $d = .85^{**}$), depression ($p < .05$, Cohen's $d = .29^{**}$), traumatic grief ($p < .001$, Cohen's $d = .97^{**}$), and existential grief ($p < .001$, Cohen's $d = .64^{**}$) compared to pre-intervention scores. The comparison group also had significant reductions in symptoms of PTSD ($p < .01$) compared to pre-intervention scores. The post-intervention and four-month follow-up means (i.e., PTSD, depression, traumatic grief, existential grief) did not significantly differ between the treatment and comparison group. However, the treatment group had significantly higher pre-intervention scores on the traumatic grief and existential grief variables than the comparison group. Pooled scores (treatment group + comparison group) indicate significant reductions in PTSD and depression symptoms from post-intervention to the four-month follow-up. Limitations noted by the authors include:

- 1) Exposure of both groups to the classroom-based intervention
- 2) Study design which focused primarily on the reduction of distress
- 3) Significantly higher pre-intervention scores on grief variables in the treatment group
- 4) Limited number of participants who completed the follow-up measures (only about half compared to post-intervention)
- 5) Follow-up measures that only assessed PTSD and depression symptoms.

In addition to these limitations, it should be noted that the lack of blinding (of the participants and the school counselors) may have biased the intervention or assessments. It also should be noted that the effectiveness of the interventions may have varied among the participants given the wide age range (13 to 19 years).

Goenjian, Karayan, Pynoos, Minassian, Najarian, Steinberg, and Fairbanks (1997) have evaluated the efficacy of a brief version of the “UCLA School-Based Trauma/Grief-Focused Group Psychotherapy” program. In this study, the intervention was implemented with adolescents from two Armenian schools severely damaged by an earthquake. The manual-

based intervention period began one and a half years after the earthquake. The adolescents received four 90-minute classroom group sessions and two one-hour individual sessions. Up to two additional individual sessions were provided to those who were most symptomatic. Two mental health professionals provided all of the sessions during a period of six weeks. The control group consisted of adolescents from two other schools that were severely damaged in the same region of Armenia. These adolescents received no intervention. Both groups included all students from two classes (i.e., one sixth grade and one seventh grade). There were 35 adolescents (69% female) who participated in the intervention group and 29 adolescents (62% female) who participated in the control group. The mean age of the entire group of participants three years post-earthquake was 13.2 years. At pre-intervention (1 ½-years post-disaster), the mean scores on the Child PTSD Reaction Index (CPTSD-RI) and Depression Self-Rating Scale (DSRS) did not significantly differ between the groups. At the follow-up (3-years post-earthquake), the intervention group had significantly lower mean scores compared to control group in relation to PTSD ($p < .01$) and depression ($p < .01$). The intervention group also had a significantly lower mean score in relation to PTSD ($p < .01$) compared to pre-intervention. There was no significant change in the mean depression score from pre-intervention to follow-up. The control group, however, had significantly higher mean scores in relation to both PTSD ($p < .01$) and depression ($p < .01$) compared to pre-intervention. The authors suggest that the intervention group participants may have benefited from additional intervention because, despite the decreases in PTSD symptoms, they remained symptomatic at the follow-up. There were no limitations noted by the authors. However, it is reasonable to conclude that lack of randomization and the use of self-reports alone (rather than a combination of self-reports and interviews for example) are among the study's limitations. In addition, it is also possible that the study lacked the use of blind assessors; however, this is unclear based on the article.

Goenjian, Walling, Steinberg, Karayan, Najarian, and Pynoos (2005) have studied the five-year post-earthquake outcome of adolescents who participated in a brief version of the “UCLA School-Based Trauma/Grief-Focused Group Psychotherapy” program. An earlier study evaluated the participants prior to the start of the manual-based intervention (i.e., 1 ½-years after the earthquake) (see Goenjian et al., 1995). The format and length of the intervention used in this study was the same as in the study described previously. This study was also implemented with adolescents from two Armenian schools severely damaged by an

earthquake. The participants in this study were, however, slightly older than the participants in the previous study. The participants ranged in age from 15 to 17 years at the five-year post-earthquake follow-up. Their mean age one and a half years post-earthquake was 13.1 years (Goenjian et al., 1995). There were 36 adolescents (61% female) who participated in the intervention group and 27 adolescents (59% female) who participated in the no-intervention control group. At the five-year follow-up, the intervention group had significantly lower scores compared to control group in relation to PTSD symptoms ($p < .01$). There were no significant differences found between the groups in relation to depression at follow-up. However, it should be noted that the intervention group had a significantly higher depression score at pre-intervention (i.e., 1 ½-years post-earthquake). In addition, the intervention group showed improvement in depression symptoms from pre-intervention to follow-up while control group showed worsened symptoms. The authors noted the following limitations to the study: 1) possible over- or underreporting of symptoms due to the use of self-reports, 2) possible influence of school milieu or teacher responsiveness on recovery, and 3) lack of instruments to measure grief reactions. In addition to these limitations, the study lacked the use of random assignment. It was also not specified in the article whether the assessors were blind to which adolescents had participated in the program. Therefore, this may have also been a limitation.

Layne, Pynoos, Saltzman, Arslanagic, Black, Savjak, Popovic, Drakovic, Music, Campara, Djapo, and Houston (2001) have studied the effectiveness of the “UCLA School-Based Trauma/Grief-Focused Group Psychotherapy” program with war-exposed adolescents in Bosnia. In this study, full intervention (i.e., modules 1-4) was compared to partial intervention (i.e., modules 1-2). School counselors trained in the manual-based program delivered the full and partial intervention sessions before, during, or after school. Each session lasted 80 to 100 minutes. A total of 55 adolescents with moderate to severe levels of PTSD symptoms participated in the study. There were 28 adolescents who completed the full intervention program and 27 who completed the partial intervention program. The participants ranged in age from 15 to 19 years. Their mean age was 16.81 years. Combined group scores (i.e., full intervention group + partial intervention group) showed significant reductions from pre-intervention to post-intervention in relation to posttraumatic stress ($p < .001$, partial $\eta^2 = .52$), grief ($p < .001$, partial $\eta^2 = .40$), and depressive symptoms ($p < .001$,

partial $\eta^2 = .39$). There were no significant differences found between the full and partial intervention groups in relation to the distress measures. The limitations noted by the authors include: 1) lack of wait-list control group, 2) lack of random assignment to treatment providers, 3) use of only self-report instruments, and 4) use of a small battery of measures. In addition, it should be noted that the study lacked the use of a follow-up. This would have provided important information as to whether the symptom reduction was maintained.

3.3.2 Play/Art/Drama

Galante and Foa (1986) have evaluated the efficacy of a school-based group intervention. There was no name specified for the program. The intervention sessions consisted of group discussions, drawing, stories, re-enacting, and role-playing. One of the researchers conducted the seven intervention sessions with the groups. These sessions lasted one-hour each and took place once a month. A total of 300 first to fourth grade children from six villages in Italy participated in the study. Baseline data was collected using the Rutter Behavioral Questionnaire for Completion by Teachers (RBQ) six-months following a devastating earthquake in the region. The screening instrument had been validated on an Italian population sample prior to the study. Sixty-two children from the village with the most children “at risk for developing neurotic or antisocial problems” served as the treatment group. All of the first to fourth grade children from this village’s elementary school participated in the treatment. The other five villages served as the no-treatment control groups. At posttest, the treatment group demonstrated a significant drop in at-risk scores on the Rutter Behavioral Questionnaire ($p = .01$) compared to pretest. Moreover, the percentage of children “at risk” decreased from 47% to 34%. One control group village also demonstrated a significant decrease in at risk scores while another demonstrated a significant increase. The authors noted that the control group village that had a significant decrease in at risk scores did not avoid earthquake issues. They did not note any limitations to the study. However, it is reasonable to conclude that lack of randomization, lack of measures for PTSD, and lack of blind assessors are among the study’s limitations. It is also possible that expectations were unintentionally conveyed to the participants as one of the researchers conducted the intervention sessions. Therefore, questions can be raised in relation to the construct validity of the study. Lastly, the treatment group consisted of just one of the six participating villages. It is therefore possible that the treatment effect that was found was related to something that had occurred within the village (independent of the intervention)

rather than the intervention itself. Thereby, the internal validity of this study may be threatened.

Chemtob, Nakashima, and Hamada (2002) have examined the effectiveness of phase one of the two-phase “Maile Project” following a hurricane. Both phases were conducted with children living on the Hawaiian island of Kauai. The second phase of this school-based intervention program will be reported in section 3.3.3 (see Chemtob, Nakashima, & Carlson, 2002). In this phase one study, manual-based individual intervention was compared to manual-based group intervention. There were four to eight children in each group in the group-based modality. The intervention sessions for both modalities involved the use of play, expressive art, and talk/discussion. The participants received four sessions of intervention. The foci for these sessions were the following: 1) “Safety and Helplessness,” 2) “Loss,” 3) “Mobilizing Competence and Issues of Anger,” and 4) “Ending and Going Forward.” School counselors and a clinical social worker trained in the program delivered the intervention sessions. A total of 248 children (60.9% female) with PTSD symptoms were randomly assigned to either individual treatment or group treatment. They were also randomly assigned to early intervention ($n = 65$) or waitlist delayed intervention ($n = 183$). All of the 248 participants scored at or above the 94th percentile for PTSD on the self-report screening (Kauai Recovery Inventory for Children). The ages of the participants ranged from six to 12 years. Their mean age was 8.2 years. In order to assess whether the pretreatment scores varied between the groups, a 1-way ANOVA was conducted by the researchers. This revealed that the scores were comparable despite the passage of time. At posttest, children in the treated wave had significantly lower PTSD symptom scores on the Child Reaction Index (CRI) than the untreated wave ($p = .01$, Cohen’s $d = .76$). The symptom reduction was maintained in the treated wave at the one-year follow-up. There were no differences found in relation to treatment efficacy between the group and the individual intervention. However, children who received group intervention were more likely to complete treatment than those who received individual intervention. The main limitation noted by the authors was the inability to withhold treatment to some of the participants during the entire course of the study. They explain that this would have been beneficial for comparison purposes but that it was not done due to ethical considerations. Another potential limitation that may have affected the results was the wide age range (6-12 years) of the participants. Although treatment effect was found, the youngest and oldest children may not have benefited to the

same extent from the same form of intervention. Notably, the study found that the children who did not complete treatment were significantly older than those who completed treatment.

Shen (2002) has studied the efficacy of child-centered play therapy conducted within the school setting. There was no name provided for the intervention program. In this study, the intervention was implemented with children in Taiwan following an earthquake. There were three children in each group. The children received ten 40-minute play therapy sessions over a course of four weeks. A school counselor trained in child-centered play therapy provided all of the sessions. A total of 30 children (53% girls) participated in the study. All of these children were identified as being at high risk for maladjustment according to Children's Mental Health Checklist (CMHC). The children ranged in age from 8 to 12 years and were in the third to sixth grades. Equal numbers of children were randomly assigned to the treatment group and the no-intervention control group. At post-treatment, the treatment group had significantly lower overall anxiety level scores on the RCMAS ($p=.004$, partial $\eta^2 = .274$). They also had significantly lower suicide risk scores on the MDI-C ($p=.019$, partial $\eta^2 = .019$) compared to control group. There was no significant difference found between the groups in relation to overall depression level scores on the MDI-C. Among the limitations noted by the author were: 1) small sample size, 2) lack of an alternative treatment control group, 3) lack of instruments designed for Chinese children, and 4) potential age and gender influence on the results. Another potential limitation was that the statistical conclusion validity of this study may have been threatened. This is because parametric tests (i.e., ANCOVA and t-tests) were applied to investigate the outcome of the intervention despite the fact that the groups were quite small (treatment group $n = 15$, control group $n = 15$). Therefore, the results must be interpreted very cautiously. In addition to this potential limitation, it should be noted that the author did not specify in the article whether significant differences were found between treatment group and the no-intervention control group at pre-treatment. Therefore, it is unclear as to whether pre-treatment differences may have affected the results.

3.3.3 Eye Movement Desensitization and Reprocessing (EMDR)

Chemtob, Nakashima, and Carlson (2002) have examined the effectiveness of phase two of the "Maile Project." In this study, manual-based Eye Movement Desensitization and Reprocessing (EMDR) was used as the treatment method. According to the authors, EMDR

is a type of exposure treatment. It involves having the child recall a distressing memory and related images/sensations while engaging in sets of back and forth eye movements (or hand tapping). The treatment in this study consisted of one diagnostic session and three treatment sessions. The sessions were provided on a once-a-week basis within the school setting. Doctoral level clinicians trained in EMDR conducted the treatment sessions. A total of 32 children (69% female) participated in this study. All of these children continued to meet PTSD criteria following the phase one treatment. The children ranged in age from 6 to 12 years. Their mean age was 8.4 years. There were 17 children assigned to the immediate treatment group and 15 assigned to the waitlist delayed treatment control group. At pre-treatment, there were no significant differences between the groups in relation to gender, grade, socioeconomic level, exposure, age, or initial screening scores on the KRI. Comparison of pre-treatment versus six-month follow-up scores revealed significant differences on the CRI ($p < .0009$, Cohen's $d = 2.04$), RCMAS ($p < .0009$, Cohen's $d = 1.07$), and CDI ($p < .0009$, Cohen's $d = .69$). The authors noted that the mere passage of time did not appear to be the substantiating cause of the treatment effects seen. Among the main limitations noted by the authors were the lack of an alternative treatment (in which EMDR could have been compared with) and the lack of a diagnostic PTSD interview at baseline and pretreatment for the waitlist control group. Additionally, it is reasonable to conclude that the statistical conclusion validity of this study may be threatened. The groups in this study were small (treatment group $n = 17$, waitlist control group $n = 15$), yet parametric tests (i.e., ANOVA and t-test) were applied to investigate the mean differences in PTSD symptoms. Given the fact that the group sizes were so small, the criteria for using parametric tests may have been violated thereby threatening statistical conclusion validity. Therefore, the results must be interpreted very cautiously.

3.3.4 Mind-Body Skills

Gordon, Staples, Blyta, Bytyqi, and Wilson (2008) have investigated the effectiveness of a group-based intervention known as “Mind-Body Skills Group Program.” The program combines the use of mind-body techniques and self-expression. Sessions include a variety of activities such as guided imagery, relaxation techniques, meditation, autogenic training, biofeedback, genograms, drawing, writing, and dancing (it should be noted that the format was manualized following the study). In this study, intervention was delivered to adolescents in Kosovo five years after war in the region. There were approximately 10 adolescents in

each group. The adolescents received 12 sessions of intervention over a period of six weeks. Each session was two-hours long and was delivered by teachers trained in the program. A total of 82 adolescents (76% female) who met PTSD criteria participated in the study. There were 41 adolescents randomly assigned to the immediate intervention group and 41 randomly assigned to the waitlist control group. The adolescents ranged in age from 14 to 18 years. Their mean age was 16.3 years. The groups had the same mean PTSD score at baseline. At post-intervention, the immediate intervention group had a significantly lower PTSD score than the waitlist control group ($p < .001$, partial $\eta^2 = .282$). The symptom reduction was maintained in the immediate intervention group at the three-month follow-up. Limitations noted by the authors include: 1) lack of a trauma exposure scale, 2) lack of independent assessors to administer the post-intervention interviews (i.e., the same teachers provided both the intervention and performed the interviews), and 3) use of an instrument which only measures changes in symptoms of PTSD and not changes in clinical diagnosis. In addition to authors' limitations, it should be noted that the study lacked the use of a long-term follow-up. An additional follow-up at a later point in time (e.g., after 1 year) would have provided valuable information as to whether the symptom reduction was maintained.

3.4 Effect size estimates

The following nine studies provided effect size estimates in the form of Cohen's d , eta-squared (η^2), or partial eta-squared: Tol et al. (2008), Stein et al. (2003), Brown et al. (2006), Salloum and Overstreet (2008), Layne et al. (2001), Chemtob, Nakashima, and Hamada (2002), Shen (2002), Chemtob, Nakashima, and Carlson (2002), and Gordon et al. (2008). The remaining 10 studies did not provide any information regarding effect size. Therefore, Cohen's d was calculated for eight of these using the online calculator mentioned in section 2.5. These studies were Kataoka et al. (2003), Yule (1992), Berger et al. (2007), Wolmer et al. (2005), Ehntholt et al. (2005), Layne et al. (2008), Goenjian et al. (1997), and Goenjian et al. (2005). The effect size estimates for these studies are presented in the table in Appendix D and are marked with two asterisks.

3.4.1 Strength of the effect sizes

Cohen's (1988) guidelines, as presented in section 2.5, can be used to interpret the strength of the effect sizes of the studies in this chapter. Of the 14 studies that used cognitive-behavioral

therapy (CBT) methods as the main treatment approach, 11 had effect sizes in the medium to large range in relation to PTSD symptoms. These studies were Tol et al. (2008), Stein et al. (2003), Yule (1992), Berger et al. (2007), Brown et al. (2006), Salloum and Overstreet (2008), Ehntholt et al. (2005), Layne et al. (2008), Goenjian et al. (1997), Goenjian et al. (2005), and Layne et al. (2001). However, the results of the Yule (1992) and Brown et al. (2006) studies must be interpreted cautiously due to their weak statistical conclusion validity. In addition to the 11 studies with medium to large effect sizes, the Kataoka et al. (2003) study had an effect size in the small range in relation to PTSD symptoms. The two remaining CBT studies, Wolmer et al. (2005) and Karam et al. (2008), did not show treatment effects in relation PTSD symptoms at the follow-up testings.

There were three studies in the Play/Art/Drama category. Effect size was not calculated for the Galante and Foa (1986) study, as the article did not provide enough information in order for the Cohen *d* formula to be used. The Chemtob, Nakashima, and Hamada (2002) study had an effect size in the large range for PTSD symptom scores. In relation to the Shen (2002) study, PTSD symptoms were not tested. Nevertheless, the study did show an effect size in the large range in relation to anxiety level scores (on the RCMAS) and in the small range in relation to suicide risk scores (on the MDI-C). The results must, however, be interpreted cautiously due to the study's weak statistical conclusion validity.

One study used Eye Movement Desensitization and Reprocessing (EMDR) as its main treatment approach. This was the Chemtob, Nakashima, and Carlson (2002) study. This study had an effect size in the large range in relation to PTSD symptoms (on the CRI). However, the results must be interpreted cautiously due to the study's weak statistical conclusion validity.

Finally, the last remaining study used mind-body skills as its main treatment approach. This was the study by Gordon et al. (2008). This study had an effect size in the large range in relation to reducing PTSD symptoms.

3.5 Accordance with the PTSD theories

It was possible to identify an underlying PTSD theory in relation to only one of the intervention programs presented in this chapter. This was the program known as "Trauma and Grief Component Therapy for Adolescents (TGCT)" and "UCLA School-Based

Trauma/Grief-Focused Group Psychotherapy.” As mentioned, this intervention program is based on Pynoos, Steinberg, and Wraith’s (1995) developmental model of childhood traumatic stress.

Despite the fact that the remaining programs do not appear to be explicitly based on a specific PTSD theory, the majority of the programs reviewed in this thesis use cognitive-behavioral therapy (CBT) methods. As discussed in chapter one, emotional processing theory (Foa & Rothbaum, 1998), dual representation theory (Brewin et al., 1996), and Ehlers and Clark’s cognitive model (Ehlers & Clark, 2000) all recommend the use of CBT methods. Therefore, it is reasonable to consider the programs that use CBT methods as in accordance with all three of the theories. More specifically, however, the use of exposure therapy methods can be considered as in best accordance with Foa’s emotional processing theory, while the use of general CBT methods can be considered as in best accordance with the two other theoretical perspectives.

Although EMDR was listed as a separate category in this thesis, it is a type of exposure therapy. Additionally, some PTSD researchers describe it as a variant of cognitive-behavioral therapy (e.g., Foa & Meadows, 1997). Therefore, the use of EMDR can also be considered as in accordance with all three of the theories.

The programs in the Play/Art/Drama and the Mind-Body Skills categories cannot be considered as in complete accordance with the three theories. This is because they do not use CBT methods as the main treatment approach. However, these programs may have components that either involve the use of CBT methods or are quite similar to CBT methods. For example, the Chemtob, Nakashima, and Hamada (2002) study stated the use of talk and discussion. It is possible that this involved the use of CBT methods (such as those involved in cognitive restructuring). It is also possible that several of the components in the Gordon et al. (2008) study, such as the relaxation techniques component, are quite similar to the behavioral techniques used in CBT approaches.

4.0 Discussion

4.1 Purpose of the thesis

The purpose of this thesis was to develop an up-to-date overview of school-based intervention programs targeted at preventing and reducing symptoms of traumatic stress. Through the use of academic databases, websites, and reference lists from relevant review articles, a large number of published research studies were compiled and reviewed. The studies that were selected were investigated to determine the effectiveness of the intervention programs in preventing or reducing symptoms of traumatic stress. In addition, the studies were categorized based on the main treatment approach used in the intervention programs. This was done to determine which of the programs were in accordance with emotional processing theory (Foa & Rothbaum, 1998), dual representation theory (Brewin et al., 1996), and Ehlers and Clark's cognitive model (Ehlers & Clark, 2000). The majority of the articles, however, lacked statements in regards to the theoretical foundations of the programs, resulting in limited empirical information for discussion of substantive issues related to the three theories.

4.2 Criteria used to select the studies

A number of inclusionary criteria were used in order to select the research studies included in this thesis. First, the studies must have had at least one no-intervention or alternative intervention control group. This criterion was used in order to better determine whether the treatment effects observed were due to the intervention programs themselves or whether they were due to other factors (e.g., natural recovery). Second, the studies must have used randomized experimental design or quasi-experimental design. As discussed in chapter 2, these two types of designs are used to study causal relationships and involve the deliberate manipulation of an independent variable. This was required as one of the objectives of this thesis was to determine the effectiveness of the intervention programs in preventing or reducing symptoms of traumatic stress. Third, the studies must have taken place with children or adolescents within a primary or secondary school setting. This criterion was used in order to better ensure the applicability of the intervention programs within Norwegian schools. The fourth and fifth criteria are interrelated. The participants must have been exposed to a traumatic event and the main aim of the intervention must have been to prevent or reduce symptoms of traumatic stress. These two criteria were used to exclude studies of intervention programs for other types of mental health needs in children and adolescents. Sixth,

standardized instruments (e.g., self-reports, structured interviews) must have been used to measure symptomatology and response to intervention. This criterion was used in order to ensure that symptomatology and response to intervention was measured in a standardized manner. However, given the time constraints of this thesis, it was not possible to investigate whether the instruments had been validated on the populations to whom they were administered. Investigation of this would have provided valuable information for making inferences in relation to the accuracy of the instruments with the specific samples.

In addition to the inclusionary criteria, one exclusionary criterion was used. This required that the studies must not have primarily targeted Type II trauma such as those resulting from sexual abuse, physical abuse, or other forms of ongoing maltreatment. As described in section 1.2, the focus of this thesis was on intervention to prevent and treat Type I trauma in the school setting. Therefore, it was necessary to exclude studies primarily targeting Type II trauma.

A total of 82 published research studies were obtained for inspection. These studies were sorted through based on the inclusionary/exclusionary criteria for this thesis. The types of studies that were excluded were described in section 3.1. The process led to the selection of the 19 studies presented in chapter 3.

4.3 Methodological limitations

The studies in this thesis had a variety of methodological limitations. Limitations specific to each study were reported in chapter 3. In this section, general limitations in relation to studies will be discussed.

Samples

In relation to the samples in the studies, there were three common limitations. First, over half of the studies lacked randomization. As discussed in chapter 2, the use of randomization helps to control threats to internal validity. Eight of the studies reviewed in this thesis randomized their entire sample. However, despite using randomization, two of the studies had intervention and control groups that varied somewhat at baseline. In the Layne et al. (2008) study, the treatment group had significantly higher scores on the traumatic grief and

existential grief variables than the comparison group. The Tol et al. (2008) study, on the other hand, had groups that varied in terms of age, displacement (i.e., fewer living in original village), and parental ratings of aggression. In addition to these two studies, the Shen (2002) study did not report whether significant differences between the groups were present at baseline. Therefore, it is unclear as to whether baseline differences may have affected the results in this study. In relation to the remaining five randomized studies, no significant differences were found between the intervention and control groups at baseline.

Second, a number of the studies had small sample sizes. In relation to a few of the studies with particularly small sample sizes, parametric tests were used. As discussed, the use of parametric tests with small sample sizes poses a threat to statistical conclusion validity.

Third, the age range of the participants was reasonably large in approximately half of the studies. That is, the use of the same intervention with children and adolescents at quite different developmental levels may have affected the results that were obtained in several of these studies. Other limitations worth noting in relation to the samples include the lack of an alternative intervention control group (or in a few cases, the lack of a no-intervention control group), low parental consent for participation, and the use of non-equivalent groups.

Lack of independent assessors

The lack of independent assessors may have influenced the outcomes that were observed in some of the studies reviewed. That is, the assessors were the same individuals who conducted the intervention programs. Therefore, construct validity may have been threatened by expectations that were unintentionally conveyed to the participants. It is unclear how many of the studies lacked the use of independent assessors, as it was not always specified in the articles who conducted the assessments. However, the Gordon et al. (2008) specifically noted the lack of independent assessors as a limitation. In their study, the same teachers both provided the intervention and the post-intervention interviews. The lack of independent assessors was also an issue in the Yule (1992) study. Here, the researchers themselves both conducted the intervention program and assessed the participants.

Lack of blinding

Only six of the studies reviewed reported the use of blinding. Additionally, the Karam et al. (2008) study was the only study that reported the use of double-blinding. The lack of blinding poses a threat to construct validity.

Follow-up

Only five of the studies reviewed conducted a follow-up one year or more after the intervention was delivered. The majority of the studies had follow-up assessments at three or six months after the intervention. However, four of the studies had no follow-up at all. The use of long-term follow-up assessments in each of the studies would have provided valuable information regarding the long-term effects of the programs. It would have also provided a better basis for comparison of the studies.

Instruments

Three issues need to be noted in relation to the instruments used. First, as mentioned in section 4.2, it was not possible to investigate whether the instruments had been validated on the populations to whom they were administered. Some of the articles reported that the instruments were translated. However, very few reported whether the instruments were validated on the specific populations that were being studied. As the studies reviewed in this thesis were conducted in 11 different countries, it is possible that this was a limitation in several of the studies. In the articles, three studies did specifically report the use of instruments that were validated or designed for other populations. This was the Kataoka et al. (2003) study, the Ehntholt et al. (2005) study, and the Shen (2002) study. The Kataoka study reported that the instruments that were used were translated into Spanish but that they were not validated on the population being studied (i.e., Latino immigrant child population). The Ehntholt study noted the use of measures based on British and American normative data with refugee/asylum-seeking children and adolescents in London as a limitation to their study. The Shen study noted the lack of instruments designed for Chinese children as a limitation.

Second, a few of the studies were limited in the number and types of instruments used. The use of only a small battery or just one type of instrument (e.g., self-reports) limits the information the researchers are able to obtain regarding the participants' symptomatology.

Third, it is important to be aware that participants may have changed the manner with which they reported the same level of symptomatology from one time of testing to another in some of the studies (Armenakis, 1988). For example, if a 5-point scale is used, a participant may rate an item as a four at the first testing and a two at the second testing despite the fact that no real change occurred.

Lack of manual

A few of the programs did not use a manual to guide the delivery of the intervention. This applies to the following studies: Yule (1992), Brown et al. (2006), Wolmer et al. (2005), Galante and Foa (1986), Shen (2002), and Gordon (2008). However, it should be noted that the format of the intervention program that was used in the Gordon study was manualized following the study.

The lack of a manual is problematic in two respects. First, it does not provide assurance that the intervention was delivered in the same manner to all of the participants. Second, it does not permit the studies to be replicated (Foa & Meadows, 1997).

Inclusionary requirements

It is important to note that the studies reviewed had differing inclusionary requirements for participation in the intervention programs. All of the studies required that the participants must have been exposed to a traumatic event. However, less than half of the studies required the presence of moderate to severe levels (or clinical levels) of PTSD symptoms. The remaining studies either did not have any requirements regarding the severity of the PTSD symptoms or did not require PTSD symptoms to be present at all. These differing inclusionary requirements were a result of the criteria used for this thesis. That is, the studies selected were not limited to intervention programs for children and adolescents with moderate to severe levels of PTSD symptoms. The rationale for not limiting the studies in this way was that programs that are preventative in nature would have been excluded.

The wide range of inclusionary requirements for PTSD symptoms, however, has some consequences for this thesis. First, differing inclusionary requirements makes it more difficult to compare the treatment effects of the programs. Second, the inclusion of participants with mild initial symptoms of PTSD in some of the studies can cause the treatment effects to be either minimized or inflated according to Foa and Meadows (1997). They explain that this is because mild initial symptoms can cause for difficulties in detecting improvements. Thereby, the treatment effects can be minimized. On the other hand, they explain that it is also more likely that the participants will show only very mild symptoms following treatment. This can lead to the treatment effects being inflated.

4.4 Discussion of the results

Before discussing the results, it is necessary to review the objectives of this thesis. In chapter one, it was outlined that the objectives of this thesis were: 1) to identify school-based intervention programs for preventing or reducing symptoms of traumatic stress, 2) to examine the effectiveness of the programs in preventing or reducing symptoms of traumatic stress, and 3) to identify the accordance of the intervention programs with emotional processing theory (Foa & Rothbaum, 1998), dual representation theory (Brewin et al., 1996), and Ehlers and Clark's cognitive model (Ehlers & Clark, 2000). The following discussion will review what was found in relation to these objectives.

Objective 1

Using the inclusionary/exclusionary criteria defined for this thesis, 19 studies were selected. These studies were conducted in Indonesia, USA, UK, Italy, Lebanon, Israel, Turkey, Bosnia, Armenia, Taiwan, and Kosovo. There were one to two studies conducted in each of these countries with the exception of the United States where six studies were conducted. School-based studies conducted in Norway were not found.

As reported in chapter 3, the selected studies dealt with various types of trauma exposure. Eight of the studies dealt with exposure to a natural disaster (i.e., hurricanes/earthquakes), six dealt with exposure to war or political violence, two dealt with exposure to community violence, two dealt with exposure to terrorism, and one dealt with exposure to a cruise ship sinking.

The studies were organized into the following categories based on the main treatment approach used: Cognitive-Behavioral Therapy (CBT), Play/Art/Drama, Eye Movement Desensitization and Reprocessing (EMDR), and Mind-Body Skills. Fourteen of the studies were placed into Cognitive-Behavioral Therapy (CBT) category, three into Play/Art/Drama, one into Eye Movement Desensitization and Reprocessing (EMDR), and one into Mind-Body Skills.

Objective 2

In section 3.4.1, the strengths of the effect sizes of the studies were reported. Fourteen of the studies had effect sizes in the medium to large range in relation to PTSD symptoms. They included the following: Tol et al. (2008), Stein et al. (2003), Yule (1992), Berger et al. (2007), Brown et al. (2006), Salloum and Overstreet (2008), Ehntholt et al. (2005), Layne et al. (2008), Goenjian et al. (1997), Goenjian et al. (2005), Layne et al. (2001), Chemtob, Nakashima, and Hamada (2002), Chemtob, Nakashima, and Carlson (2002), and Gordon et al. (2008). However, it must be noted that three of the studies (i.e., Yule, 1992; Brown et al., 2006; Chemtob, Nakashima, & Carlson, 2002) had questionable statistical conclusion validity.

Four of the studies that had effect sizes in the medium to large range in relation to PTSD symptoms stand out as particularly good in relation to research design. They included the following: Tol et al. (2008), Stein et al. (2008), Layne et al. (2008), and Chemtob, Nakashima, and Hamada (2002). These studies used randomization, required for the presence of PTSD symptoms, had a total sample size of over 100 participants, included a follow-up at least three months after the intervention, and were manual-based. The first three of these studies were included in the CBT category while the last study was included in the Play/Art/Drama category.

Of the 14 studies that used CBT methods as the main treatment approach, 11 had effect sizes in the medium to large range in relation to PTSD symptoms. Many of these studies also had effect sizes in the medium to large range in relation to other psychological problems (e.g., depression and anxiety). The results of the non-CBT studies were more mixed. Nevertheless, three had promising results. However, as each of these were isolated studies, further research is needed to establish the efficacy of the programs.

The first of the non-CBT programs that had promising results was the Chemtob, Nakashima, and Hamada (2002) play and art therapy study. This study had an effect size in the large range in relation to reducing PTSD symptoms. The treatment approach involved the use of play, expressive art, and talk/discussion. As noted in chapter three, the talk/discussion component of this program may involve the use of CBT methods. It is reasonable to speculate that this component may therefore be responsible for the change in PTSD symptoms rather than the use of play and art therapy.

The second study was the Chemtob, Nakashima, and Carlson (2002) Eye Movement Desensitization and Reprocessing (EMDR) study. EMDR was listed as a separate category in this thesis. However, as reported in chapter three, Eye Movement Desensitization and Reprocessing (EMDR) is a type of exposure therapy and some PTSD researchers describe it as a variant of cognitive-behavioral therapy (e.g., Foa & Meadows, 1997). This study had an effect size in the large range in relation to reducing PTSD symptoms; however, the results must be interpreted cautiously due to the study's questionable statistical conclusion validity.

The last of the non-CBT studies that had promising results was the Gordon et al. (2008) mind-body skills study. This study had an effect size in the large range in relation to reducing PTSD symptoms. The program combines the use of mind-body techniques (such as relaxation techniques and guided imagery) and self-expression (such as drawing and writing). As reported in chapter three, it is possible that several of the techniques used in the program are quite similar the behavioral techniques used in CBT approaches. Therefore, it is again reasonable to speculate that these CBT-like techniques may be responsible for the change in PTSD symptoms.

Objective 3

In relation to an underlying theory of PTSD, none of the intervention programs appeared to be explicitly based on emotional processing theory (Foa & Rothbaum, 1998), dual representation theory (Brewin et al., 1996), or Ehlers and Clark's cognitive model (Ehlers & Clark, 2000). However, one of the intervention programs was explicitly based on Pynoos, Steinberg, and Wraith's (1995) developmental model of childhood traumatic stress. This was the program known as "Trauma and Grief Component Therapy for Adolescents (TGCT)" and "UCLA School-Based Trauma/Grief-Focused Group Psychotherapy." Variations of this

program was used by four of the studies presented in chapter three (i.e., Goenjian et al., 1997; Goenjian et al., 2005; Layne et al., 2001; Layne et al., 2008).

Emotional processing theory, dual representation theory, and Ehlers and Clark's cognitive model conceptualize the development and maintenance of PTSD in various ways. However, they each suggest the use of cognitive-behavioral therapy (CBT) methods in the treatment of the disorder. As reported in chapter three, the programs that used CBT methods and Eye Movement Desensitization and Reprocessing (EMDR) can be considered to be in accordance with all three of the theories. In addition, some components from the programs in the Play/Art/Drama and Mind-Body Skills categories, which involve the use of CBT methods or are similar to CBT methods, can be considered to be in accordance with the theories.

As the majority of the studies that used CBT methods had effect sizes in the medium to large range in relation to PTSD symptoms, empirical support is provided to all three of the PTSD theories. Therefore, the results of the CBT studies will be discussed from the perspective of each of the theories.

From the perspective of emotional processing theory, the reduction in PTSD symptoms was due to the success of the CBT programs at helping the participants create new non-pathological associations in their fear structures. According to the theory, treatment helps individuals to emotionally process trauma memories so that new associations can be created. The goal is to make the new associations more likely of being activated in the natural environment than the old pathological ones.

Unlike the two other theories, emotional processing theory specifically recommends that exposure therapy be used as the main treatment approach. It is posited by the theory that exposure therapy promotes emotional processing and helps to disconfirm pathological elements of the fear structure. However, it is also recommended that other CBT methods (such as cognitive restructuring) be combined with exposure therapy in some situations.

As can be seen from the narrative summaries of the programs in chapter three (as well as Appendix D), exposure methods were commonly used in the CBT programs. However, none of the studies used exposure methods alone. All combined the use of exposure methods with other CBT methods. Given this, inferences cannot be made in regards to the use of exposure methods alone versus the use of exposure combined with other CBT methods. Related to this, however, it should be noted that the Chemtob, Nakashima, and Carlson (2002) Eye

Movement Desensitization and Reprocessing study used the EMDR technique alone. As discussed, EMDR is a type of exposure therapy. Despite the large effect size in relation to PTSD symptoms in the study, caution must be taken in generalizing the results due to two issues. First, the study had questionable statistical conclusion validity. This was because parametric tests were used with small group sizes. Second, no other school-based EMDR studies were found.

From the perspective of dual representation theory, the reduction in PTSD symptoms was due to the success of the CBT programs at accomplishing two tasks. First, the programs must have helped the participants to develop new VAM memories to block the undesirable SAM memories. Second, the programs must have helped the participants to establish identities that were more positive.

Finally, from the perspective of Ehlers and Clark's cognitive model, the reduction in PTSD symptoms was due to the success of the CBT programs at creating change in three areas. Firstly, the programs must have reduced involuntary re-experiencing of the trauma by helping the participants to elaborate and integrate their trauma memories with other autobiographical memories. Secondly, the programs must have helped the participants to change problematic appraisals that had contributed to a sense of current threat. Thirdly, the programs must have helped the participants to abandon maladaptive behavioral and cognitive strategies.

4.5 Implementation issues

Individuals with a variety of backgrounds served as instructors in the studies. Four of the studies used teachers, six used other school professionals (e.g., school counselors, school psychiatric social workers), eight used outside mental health professionals or social workers, and one used adults with at least a high school level of education.

In regards to the studies that used school professionals, the four programs delivered by teachers had mixed results. Two of the studies, Berger et al. (2007) and Gordon et al. (2008), had effect sizes in the large range in relation to reducing PTSD symptoms. The Berger study involved classroom-based intervention while the Gordon study involved group-based intervention. The two other studies, Karam et al. (2008) and Wolmer et al. (2005), showed no treatment effect. Both of these studies involved classroom-based intervention.

On the other hand, the six studies delivered by other school professionals had good results overall. Five of these studies used group-based intervention and one combined the use of group and classroom-based intervention. Four of the studies, Stein et al. (2003), Layne et al. (2008), Layne et al. (2001), and Chemtob, Nakashima, and Hamada (2002), had effect sizes in the large range in relation to reducing PTSD symptoms. The Kataoka et al. (2003) study had an effect size in the small range. The last study, Shen (2002), did not test PTSD symptoms but had an effect size in the large range in relation to reducing anxiety symptoms. In relation to the results of these studies, it should be noted that the Chemtob, Nakashima, and Hamada (2002) study compared group-based intervention to individual intervention and found no differences in relation to treatment efficacy.

These findings suggest that school professionals can be successfully utilized in providing intervention to children and adolescents following traumatic events. Additionally, group or individual intervention for those with PTSD symptoms appears to be a better choice than providing classroom-based intervention to all students. However, as the number of classroom-based studies was limited, more research is needed to determine whether classroom-based intervention can have important preventative benefits that were not identified in these studies.

Training and supervision are central to the successful implementation of intervention programs for PTSD. Nearly all of the intervention programs reviewed in this thesis involved the training of the instructors prior to the intervention. Many also involved training and supervision during the entire course of the intervention. Therefore, this underscores the need for training and collaboration with outside specialists to ensure that instructors have the knowledge they need to deliver the programs appropriately. In relation to the Norwegian school setting, mental health specialists from the local educational and counseling service (“Pedagogisk psykologisk tjeneste”) or child guidance clinic (“Barne- og ungdomspsykiatrisk poliklinikk”) can for example provide this guidance. In some cases, it may also be appropriate and feasible for specialists from these agencies deliver the intervention program themselves within the school setting.

In addition to training and supervision, some other issues are important to note in relation to implementation. First, programs must be adapted to the specific needs of the children or adolescents and the type of trauma exposure. Second, a positive relationship with the instructor is essential. The use of a school employee may therefore be beneficial as this would

be someone familiar to the students. If the school has a social worker or child welfare officer on staff, this individual may be an appropriate choice for providing the intervention. Third, intervention should involve collaboration with parents. Parents can both provide valuable information regarding their son or daughter's needs and can provide critical support outside the school setting.

Finally, there are several situations in which children and adolescents need to be referred for outside treatment. These include but are not limited to the following situations: 1) Type II trauma exposure, 2) presence of suicidal thoughts, and 3) presence of self-endangering behaviors. Additionally, children and adolescents who continue to demonstrate moderate to severe levels of PTSD symptoms following school-based intervention should be referred for outside treatment. Therefore, it is important that school professionals are equipped in knowing when and how to make such referrals.

4.6 Ongoing research

It is important to note some ongoing research that will provide additional information regarding intervention programs for preventing and reducing symptoms of PTSD in children and adolescents. First, there is one Norwegian clinic-based randomized study currently underway in three child guidance clinics. The Norwegian Centre for Violence and Traumatic Stress Studies (NKVTS) is leading the study. The aim is to investigate the effectiveness of an intervention known as Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) in treating traumatized children and adolescents between the ages of 10 to 18 years (Norwegian Centre for Violence and Traumatic Stress Studies, 2008). TF-CBT is manual-based program and consists of 12 to 15 sessions. Although TF-CBT has not been studied within the school setting as of yet, Jaycox et al. (2006) note that school counselors have been trained online in the program (see <http://tfcbt.musc.edu/>). They also note that a school-based study is planned to be carried out in South Carolina, USA.

Secondly, two Cochrane reviews are currently underway. The first protocol is entitled "Sports, games and play-based interventions for post-traumatic stress disorder (PTSD)" (Lawrence, De Silva, & Henley, 2008). This review will look at the effectiveness of sports, games, and play-based interventions in treating PTSD. Interventions aimed at preventing PTSD will be excluded from the review. The second protocol is entitled "Psychological therapies for the prevention and treatment of post-traumatic stress disorder in children and

adolescents” (Gillies, O’Brien, Rogers, & Meekings, 2007). This review will look at the effectiveness of psychological therapy interventions for children and adolescents meeting clinical diagnostic criteria for PTSD (e.g., ICD-10 or DSM-IV). The interventions will not be limited to a specific setting such as school or clinic nor will they be limited to a single type of trauma.

4.7 Conclusion

The majority of the intervention programs in this thesis used cognitive-behavioral therapy (CBT) methods as the main treatment approach. The reason why CBT was commonly chosen is likely due to its substantial empirical support as an efficacious treatment for various mental health disorders. As the use of CBT methods was found to be largely effective in relation to the programs, the findings provide further empirical support for the CBT approach. They demonstrate that the theoretical principles underlying CBT are of importance for the improvement of traumatic stress symptoms. The findings additionally provide empirical support for emotional processing theory, dual representation theory, and Ehlers and Clark’s cognitive model. That is, the findings support the theories’ suggestions that the use of CBT methods can facilitate the improvement of traumatic stress symptoms.

The findings of this thesis have three important implications. First, they suggest that intervention provided within the school setting can be effective in helping children and adolescents following a variety of traumatic events. Second, they suggest that school professionals can be successfully utilized in providing school-based intervention. Third, they point to the need for research within the Norwegian school setting. Such research will provide important information regarding the specific outcomes and needs of Norwegian children and adolescents.

Appendix A: *DSM-IV-TR* Diagnostic Criteria for Posttraumatic Stress Disorder

- A. The person has been exposed to a traumatic event in which both of the following were present:
- (1) 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
 - (2) the person's response involved intense fear, helplessness, or horror. **Note:** In children, this may be expressed instead by disorganized or agitated behavior
- B. The traumatic event is persistently reexperienced in one (or more) of the following ways:
- (1) recurrent and distressing recollections of the event, including images, thoughts, or perceptions. **Note:** In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
 - (2) recurrent distressing dreams of the event. **Note:** In children, there may be frightening dreams without recognizable content.
 - (3) acting or feeling if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). **Note:** In young children, trauma-specific reenactment may occur.
 - (4) intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
 - (5) physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
- C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three or more of the following:
- (1) efforts to avoid thoughts, feelings, or conversations associated with the trauma
 - (2) efforts to avoid activities, places, or people that arouse recollections of the trauma
 - (3) inability to recall an important aspect of the trauma
 - (4) markedly diminished interest or participation in significant activities
 - (5) feeling of detachment or estrangement from others
 - (6) restricted range of affect. (e.g., unable to have loving feelings)
 - (7) sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)

- D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:
- (1) difficulty falling or staying asleep
 - (2) irritability or outbursts of anger
 - (3) difficulty concentrating
 - (4) hypervigilance
 - (5) exaggerated startle response
- E. Duration of the disturbance (symptoms in Criteria B, C, and D) is more than one month.
- F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:

Acute: if duration of symptoms is less than three months

Chronic: if duration of symptoms is three months or more

Specify if:

With Delayed Onset: if onset of symptoms is at least 6 months after the stressor

Source: Reprinted with permission from the *Diagnostic and Statistical Manual of Mental Disorders, Text Revision, Fourth Edition* (Copyright 2000). American Psychiatric Association.

Appendix B: ICD-10 Diagnostic Criteria for Posttraumatic Stress Disorder

- A. The patient must have been exposed to a stressful event or situation (either short- or long-lasting) of exceptionally threatening or catastrophic nature, which would be likely to cause pervasive distress in almost anyone.

- B. There must be persistent remembering or "reliving" of the stressor in intrusive "flashbacks", vivid memories, or recurring dreams, or in experiencing distress when exposed to circumstances resembling or associated with the stressor.

- C. The patient must exhibit an actual or preferred avoidance of circumstances resembling or associated with the stressor, which was not present before exposure to the stressor.

- D. Either of the following must be present:
 - (1) inability to recall, either partially or completely, some important aspects of the period of exposure to the stressor;
 - (2) persistent symptoms of increased psychological sensitivity and arousal (not present before exposure to the stressor), shown by any two of the following:
 - (a) difficulty in falling or staying asleep;
 - (b) irritability or outbursts of anger;
 - (c) difficulty in concentrating;
 - (d) hypervigilance;
 - (e) exaggerated startle response.

- E. Criteria B, C, and D must all be met within 6 months of the stressful event or of the end of a period of stress. (For some purposes, onset delayed more than 6 months may be included, but this should be clearly specified.)

Source: Reprinted with permission from *The ICD-10 Classification of Mental and Behavioural Disorders: Diagnostic Criteria for Research* (Copyright 1993). World Health Organization.

Appendix C: Internet resources

Internet resources used to obtain relevant research studies

National Child Traumatic Stress Network: <http://www.nctsnet.org>

Norwegian Center for Crisis Psychology: <http://www.krisepsyk.no/>

Norwegian Centre for Violence and Traumatic Stress Studies (NKVTS):
<http://www.nkvts.no>

Norwegian Directorate of Health: <http://www.helsedirektoratet.no/>

NREPP (National Registry of Evidence-based Programs and Practices):
<http://www.nrepp.samhsa.gov>

The Cochrane Database of Systematic Reviews: <http://www.thecochranelibrary.org>

The EBSCOhost and Bibsys Mime online reference systems were accessed through the University of Stavanger library: http://www.uis.no/om_uis/universitetsbiblioteket .

Other internet resources

Online Effect Size Calculator (provided by Lee A. Becker from the University of Colorado at Colorado Springs): <http://web.uccs.edu/lbecker/Psy590/escalc3.htm>

Children and War Foundation: <http://www.childrenandwar.org>

TF-CBT Web (a web-based learning course for Trauma-Focused Cognitive-Behavioral Therapy): <http://tfcbt.musc.edu/>

Appendix D: School-based studies

Author/ program or manual name	Research design	Trauma type (and location)	Participants	Intervention components	Measures	Findings
COGNITIVE-BEHAVIORAL THERAPY						
Tol et al. (2008) Classroom-Based Intervention (CBI)	Randomized experimental design, cluster randomization, waitlist control group, pretest + posttest, 6-month follow-up	Political violence (Indonesia)	403 children with PTSD/ related symptoms; 182 (54.4% girls) assigned to experimental treatment group, 221 (43% girls) assigned to control group; ages 7-15 years ($M = 9.94$ years)	Manual-based group intervention; approx. 15 students per group; CBT techniques combined with cooperative play and creative-expressive exercises (drama, dance, music); 5 week-15 session program Instructors: Adults (18+ yrs) trained in use of program; at least high school education	CPSS; DSRS; SCARED-5; CAS-P; CHS	Significant improvement in PTSD symptoms in treatment group compared to control group at 6-month follow-up ($p < .001$, Cohen's $d = .44$); hope scores were maintained in treatment group but decreased in control group ($p < .001$, Cohen's $d = .38$); no significant differences between groups in relation to traumatic idioms, depressive symptoms, anxiety, and functioning scores.
Stein et al. (2003)* Cognitive Behavioral	Randomized experimental design, waitlist delayed	Community violence (USA)	126 children with PTSD symptoms in the clinical range; 61 (54% girls) assigned to	Manual-based group intervention; 5-8 children per group; CBT techniques (cognitive therapy,	LES; CPSS; CDI; PSC; TCRS	Early intervention group had significantly lower scores in relation to symptoms of PTSD (Cohen's $d = 1.08$),

<p>Intervention for Trauma in Schools (CBITS)</p>	<p>intervention control group, pretest + 3-month and 6-month follow-up</p>		<p>early intervention group, 65 (58% girls) assigned to delayed intervention group; 6th grade ($M = 11$ years)</p>	<p>exposure, social problem-solving) using didactic presentation, age-appropriate examples, games, worksheets; 10 group sessions + 1 individual session (imaginal exposure)</p> <p>Instructors: School psychiatric social workers trained in the program</p>		<p>depression (Cohen's $d = .45$), and psychosocial dysfunction (Cohen's $d = .77$) after 3 months of intervention compared to delayed intervention group.</p> <p>No significant differences between the groups after both groups had received intervention (at 6 months).</p>
<p>Kataoka et al. (2003)* Mental Health for Immigrants Program (MHIP) (based on Cognitive Behavioral Intervention for Trauma in Schools)</p>	<p>Quasi-experimental design, partly randomized, waitlist delayed intervention control group, pretest + 3-month follow-up</p>	<p>Community violence (USA)</p>	<p>198 immigrant children (50% female) with PTSD and/or depression symptoms in the clinical range; 152 children received intervention, 46 children were in the waitlist control group; 3rd-8th grade ($M = 11$ years)</p>	<p>Manual-based group intervention; 5-8 children per group; based on CBITS; CBT techniques (cognitive therapy, exposure, social problem-solving) using didactic presentation, age-appropriate cartoons, games, worksheets; 8 group sessions + 1 individual session (imaginal exposure), 8 optional sessions for parents; all sessions</p>	<p>LES; CPSS; CDI</p>	<p>Intervention group had significantly lower scores on symptoms of PTSD ($p < .05$, Cohen's $d = .25^{**}$) and depression ($p < .01$, Cohen's $d = .31^{**}$) compared with waitlist group at 3-month follow-up.</p> <p>On average, symptoms remained in clinical range in the intervention group.</p>

				delivered in Spanish		
				Instructors: Master's level school psychiatric social workers trained in the program		
Yule (1992)* Debriefing + Group Therapy (no specific name of program provided)	Quasi-experimental design, no intervention control group, single testing (5 to 9 months following the disaster)	Cruise ship sinking (UK)	39 survivors of a cruise ship sinking; 24 girls from one school received intervention while 15 girls from a second school served as the control group; age of intervention group 14-16 years (age of control group unknown)	Debriefing meeting 10 days after the disaster + group sessions using cognitive behavioral methods (number of group sessions not reported) Instructors: Mental health professionals (researchers)	FSSC (modified form); RCMAS; DSRS; R-IES	Intervention group had significantly lower intrusion and avoidance scores on the Impact of Events Scale ($p < .01$, Cohen's $d = 1.0^{**}$) as well as significantly lower overall fears on the Fear Survey Schedule ($p < .05$, Cohen's $d = .54^{**}$) at 5 to 9 month post-disaster testing compared to control group. Anxiety and depression scores were slightly lower.
Karam et al. (2008) Group/ Classroom Therapy (no specific name)	Quasi-experimental design, matched no intervention control group, double-	War (Lebanon)	2500 children from 6 villages heavily exposed to war received intervention; 101 (51.5% male) randomly	Manual-based classroom intervention; cognitive-behavioral strategies and stress inoculation training; daily 60-minute	DICA-R; WEQ	No treatment effect found at follow-up. No significant differences between the intervention and control group in relation to major depressive disorder,

of program provided)	blinded, pre-test (3-4 weeks post-war) + follow-up (1 year post-war)		selected students formed treatment group, 93 (50.5% male) students from schools where intervention did not take place formed control group; ages 6-18 years ($M = 11.7/11.8$ years)	sessions over 12 consecutive school days Instructors: Teachers trained in delivering program		separation anxiety disorder, and posttraumatic stress disorder.
Berger, Pat-Horenczyk, & Gelkopf (2007) Overshadowing the Threat of Terrorism (OTT)	Quasi-experimental design, quasi-randomized, waitlist control group, single-blinded, pretest (1 week before intervention) + posttest (2 months following intervention)	Terrorism (Israel)	142 children from 10 classes (5 classes received intervention); 70 children (55.7% male) formed immediate intervention group, 72 children (52.8% male) formed waitlist control group; ages 7-11 years (2 nd to 6 th grade)	Classroom-based manualized intervention; cognitive-behavioral methods, art therapy techniques, body-oriented strategies, narrative approaches, homework assignments; eight 90-minute sessions Instructors: Teachers trained in the program	UPID; CDIS; DPS; SCARED	Intervention group had significant reductions in PTSD symptoms ($p < .001$, Cohen's $d = .99^{**}$), somatic complaints ($p < .001$, Cohen's $d = .64^{**}$), separation anxiety ($p < .001$, Cohen's $d = .55^{**}$) and general anxiety ($p < .001$, Cohen's $d = .96^{**}$) compared to control group.
Brown, McQuaid, Farina, Ali, &	Quasi-experimental design, no-	Terrorism (USA)	59 children from five classes in charter school	Cognitive behavior therapy (CBT); individual	TESI; CPSS; MASC; CDI; BASC-	Significant time x group interaction for CPSS total ($p = .004$, $\eta^2 = .14$), re-

<p>Winnick-Gelles (2006)</p> <p>Prevention of Adverse Reactions To Negative Events and Related Stress (PARTNERS) Program</p>	<p>intervention control group (no-PTSD), pretest-posttest, no follow-up</p> <p>(Step 1 of the study did not use a control group. Therefore, data and findings from this step are excluded.)</p>		<p>(54% male at step 1 of study); 18 children (with PTSD) received individual intervention, 41 children (without PTSD) did not receive intervention; ages 8-13 years (3rd-7th grades)</p>	<p>intervention; exposure therapy, controlled breathing, progressive muscle relaxation, cognitive restructuring, positive imagery, problem-solving, anger management; six 45-minute sessions.</p> <p>Instructor: Clinical social worker</p>	<p>PRS; ChIA</p>	<p>experiencing ($p = .045$, $\eta^2 = .07$), and avoidance ($p = .005$, $\eta^2 = .13$). Significant decreases in re-experiencing, avoidance, and total symptoms in children who met PTSD criteria prior to individual intervention. No significant changes in children who did not meet criteria.</p>
<p>Salloum & Overstreet (2008)</p> <p>Project LAST (loss and survival team)</p>	<p>Randomized experimental design, group intervention vs. individual intervention, single blinded, pretest + posttest, 3-week follow-up</p>	<p>Hurricane (USA)</p>	<p>56 children (62.5% male) with moderate-severe levels of PTSD symptoms; random assignment to individual therapy ($n = 28$) and group therapy ($n = 28$); ages 7-12 years (2nd-6th grade)</p>	<p>Manual-based; cognitive behavioral therapy + narrative therapy techniques; use of developmentally specific methods; 10 (1-hour) sessions delivered during or after school; 5-6 children per group; children in group treatment received 1 individual session</p> <p>Instructors: Master's-level social workers</p>	<p>DEQ (adapted version); UPID; MFQ-C; UCLA-GI-R</p>	<p>Significant decreases from pre-assessment to the three-week follow-up in symptoms of PTSD ($p = .001$, Cohen's $d = 1.82$), depression ($p = .001$, Cohen's $d = 1.11$), traumatic grief ($p = .001$, Cohen's $d = 1.13$), and global distress ($p = .006$, Cohen's $d = .60$). No significant differences found between the group and individual intervention.</p>

<p>Wolmer, Laor, Dedeoglu, Siev, & Yazgan (2005)</p> <p>School Reactivation Program</p>	<p>Quasi-experimental design, no intervention control group, partly single-blinded, 3-year follow-up of participating children from 2003 study</p>	<p>Earthquake (Turkey)</p>	<p>287 children from 3 schools in disaster area; 67 (60.6% girls) received intervention, 220 (51.4% girls) did not receive intervention; mean age= 11.5 years (at 3 year follow-up), 1st-5th grade (at time of intervention)</p>	<p>Classroom-based intervention; psycho-educational modules, cognitive-behavioral techniques, play activities, personal diaries; all children in the classes participated; eight 2-hour sessions over 4 weeks</p> <p>Instructors: Teachers trained in the program</p>	<p>TDGS; CPTSD-RI (Turkish version); rating scale for daily functioning (academic performance, social behavior and general conduct) completed by teachers</p>	<p>Compared to the post-intervention assessment, the intervention group had significant decreases in post-trauma ($p<.02$), grief ($p<.001$), and dissociation ($p<.001$) at the 3-year follow-up. Compared to the control group, there were no significant differences in relation to symptomatology. Teachers rated children in intervention group significantly higher compared to control group in relation to academic performance ($p<.003$, Cohen's $d=.45^{**}$), social behavior ($p<.05$, Cohen's $d=.32^{**}$) and general conduct ($p<.008$, Cohen's $d=.40^{**}$).</p>
<p>Ehnholt, Smith, & Yule (2005)</p> <p>Teaching Recovery</p>	<p>Quasi-experimental design, waitlist delayed intervention</p>	<p>Refugees/asylum-seekers from war-affected countries</p>	<p>26 children and adolescents (65% male) referred by teachers due to exposure to traumatic events/</p>	<p>Manual-based group intervention for refugees/ asylum-seekers; cognitive behavioral therapy techniques; teach</p>	<p>R-IES; DSRs; RCMAS; WTQ; SDQ</p>	<p>Immediate intervention group had significantly lower scores in relation to PTSD symptoms ($p=.003$, Cohen's $d=.88^{**}$) and anxiety symptoms</p>

Techniques	control group, pretest-posttest, 2-month follow-up of 8 students from immediate intervention group	(UK)	concerns about emotional well-being; 15 assigned to early intervention group, 11 assigned to waitlist control group; ages 11-15 years ($M=12.47/13.46$ years)	children about PTSD symptoms and coping strategies; up to 8 children per group; weekly 1-hour session over six weeks Instructors: Clinical psychology trainee		(p= .018, Cohen's $d=.64^{**}$) compared to control group at the posttest. However, PTSD symptom reduction was not maintained at follow-up.
Layne et al. (2008) Trauma and Grief Component Therapy for Adolescents (TGCT) (formerly known as UCLA School-Based Trauma/Grief-Focused Group Psychotherapy)	Randomized experimental design, group-based TGCT + classroom-based intervention vs. classroom-based intervention alone, pretest-posttest, 4-month follow-up	War (Bosnia)	127 adolescents with severe symptoms of PTSD, depression or grief; 66 adolescents (63% female, ages 13-18) assigned to treatment group, 61 adolescents (66% female, ages 14-19 years) assigned to comparison group	Manual-based group intervention (psycho-education, skill building, processing of traumatic experiences/grief reactions, etc.); pre-group interview + 4 treatment modules; 6-10 adolescents per group; 17-20 weekly sessions lasting 60-90 minutes; both the treatment group and comparison group received the classroom-based intervention based on the modules in the	UPID; DSRS; UCLA-GI	Treatment group had significant reductions in symptoms of PTSD ($p<.001$, Cohen's $d=.85^{**}$), depression ($p<.05$, Cohen's $d=.29^{**}$), traumatic grief ($p<.001$, Cohen's $d=.97^{**}$), and existential grief ($p<.001$, Cohen's $d=.64^{**}$) from pretest to posttest. Comparison group had significant reductions in symptoms of PTSD ($p<.01$, Cohen's $d=.50^{**}$) from pretest to posttest. Posttest and follow-up means did not significantly differ

				<p>manual throughout the school year</p> <p>Instructors: School counselors trained in the program</p>		<p>between the treatment and comparison group. Pooled scores (treatment + comparison) indicate significant reductions in PTSD and depression symptoms from posttest to follow-up.</p>
<p>Goenjian et al. (1997)*</p> <p>UCLA School-Based Trauma/Grief-Focused Group Psychotherapy Program</p>	<p>Quasi-experimental design, no-intervention control group, pretest (1 ½-years post-disaster) + follow-up between 13-14 months following treatment (3-years post-disaster)</p>	<p>Earthquake (Armenia)</p>	<p>64 adolescents from 4 schools that were severely damaged; 2 schools (35 students, 69% female) received intervention, 2 schools (29 students, 62% female) served as control group; 6th & 7th grade; mean age of all subjects= 13.2 years (at 3 years post-disaster)</p>	<p>Manual-based group/individual intervention (psycho-education, reconstruction of trauma experiences, identification of trauma reminders + exposure, coping skills, assistance with grief resolution, assistance to reengage in activities, etc.); four 90-minute group sessions + two 1-hour individual sessions; most symptomatic adolescents received up to 2 additional individual sessions; 6-week treatment period</p> <p>Instructors: Mental</p>	<p>CPTSD-RI; DSRS</p>	<p>Intervention group had significantly lower mean scores compared to control group in relation to PTSD ($p < .01$, Cohen's $d = 1.29^{**}$) and depression ($p < .01$, Cohen's $d = .79^{**}$) at follow-up. Intervention group had a significantly lower mean score in relation to PTSD ($p < .01$) at follow-up compared to pre-intervention. There was no significant change in mean depression score from pre-intervention to follow-up. Control group had significantly higher scores in relation to PTSD ($p < .01$) and depression ($p < .01$) at follow-up compared to</p>

				health professionals		pre-intervention scores.
Goenjian et al. (2005) UCLA School-Based Trauma/Grief-Focused Group Psychotherapy Program	Quasi-experimental design, no-intervention control group, pretest (1 ½-years post-disaster) + follow-up (5-years post-disaster)	Earthquake (Armenia)	63 adolescents; 36 (61% female) received intervention, 27 (59% female) did not receive intervention; 16-17 years old (at 5 year follow-up)	Manual-based group/individual intervention (psycho-education, reconstruction of trauma experiences, identification of trauma reminders + exposure, coping skills, assistance with grief resolution, assistance to reengage in activities, etc.); four 90-minute group sessions + two 1-hour individual sessions; most symptomatic adolescents received up to 2 additional individual sessions; 6 week treatment period Instructors: Mental health professionals	CPTSD-RI; DSRS	Intervention group had significantly lower scores compared to control group in relation to PTSD symptoms ($p < .01$, Cohen's $d = .69^{**}$) at 5-year follow-up. No significant differences between the groups in relation to depression at 5-years (however, the intervention group had a significantly higher score at 1 ½ years). Intervention group showed improvement in depression symptoms from 1 ½ to 5 years while control group showed worsened symptoms.
Layne et al. (2001)* UCLA School-	Quasi-experimental design, compared full	War (Bosnia)	55 adolescents (81% female) with moderate to severe levels of	Manual-based group intervention (psycho-education, therapeutic exposure, cognitive	UPID; GSS; DSRS; CSRS; SSS	Combined group scores (full intervention group+ partial intervention group) show significant

Based Trauma/Grief-Focused Group Psychotherapy Program	intervention (modules 1-4) with partial intervention (modules 1-2), pretest + posttest, no follow-up		posttraumatic stress symptoms; 28 adolescents completed full intervention program, 27 adolescents completed partial intervention program; ages 15-19 years ($M=16.81$ years)	restructuring, stress management-relaxation skills, problem solving, etc.); full intervention program consists of 4 modules and approximately 20 sessions Instructors: School counselors trained in the program		reductions in relation to posttraumatic stress ($p<.001$, $\eta^2=.52$), grief ($p<.001$, $\eta^2=.40$), and depressive symptoms ($p<.001$, $\eta^2=.39$) from pre-intervention to post-intervention. No significant differences found between the full and partial intervention groups in relation to the distress measures.
PLAY/ART/DRAMA						
Galante & Foa (1986)* Art/Drama Therapy (no specific name of program provided)	Quasi-experimental design, no intervention control groups, pretest-posttest, no follow-up	Earthquake (Italy)	300 children from six villages; 62 children in treatment group (village with most children “at risk”), 5 villages served as control groups; 1 st -4 th grade	Group intervention; sessions consisted of drawing, stories, role-playing, group discussions; 7 one-hour sessions once a month Instructor: Mental health professional (researcher)	RBQ (validated on Italian population sample)	Treatment group had a significant drop in at-risk scores on the Rutter Behavioral Questionnaire from pretest to posttest ($p=.01$). One control group also had significant decrease and one had a significant increase.
Chemtob, Nakashima, & Hamada (2002)*	Randomized experimental design, individual vs.	Hurricane (USA)	248 children (60.9% female) with PTSD symptoms	Manual-based group therapy /manual-based individual therapy; psychosocial	KRI; CRI	Children in the treated wave had significantly lower PTSD symptom scores on the CRI than

<p>Maile Project (phase 1)</p>	<p>group treatment, 2 waitlist delayed intervention control groups, single-blinded, pretest + posttest, 1-year follow-up</p>		<p>assigned to group or individual treatment; ages 6-12 years ($M = 8.2$ years)</p>	<p>treatment (play/co-operative play, use of expressive art, talk/discussion); 4-8 children per group in group therapy; 4 sessions</p> <p>Instructors: School counselors and clinical social worker trained in the program</p>	<p>the untreated wave at posttest ($p = .01$, Cohen's $d = .76$). Symptom reduction was maintained at the one-year follow-up. No differences found in relation to the treatment efficacy between group and individual intervention. Children in the group intervention were more likely to complete treatment.</p>
<p>Shen (2002) Play Therapy (no specific name of program provided)</p>	<p>Randomized experimental design, no intervention control group, pretest + posttest, no follow-up</p>	<p>Earthquake (Taiwan)</p>	<p>30 at high risk for maladjustment (53% girls); 15 assigned to treatment group, 15 assigned to control group; ages 8-12 (3rd-6th graders)</p>	<p>Child-centered play therapy; 3 children per group; ten 40-minute sessions over 4 weeks</p> <p>Instructors: School counselor trained in child-centered play therapy</p>	<p>CMHC; FPC; RCMAS; MDI-C</p> <p>Treatment group had significantly lower overall anxiety level scores on the RCMAS ($p = .004$, partial $\eta^2 = .274$) and significantly lower suicide risk scores on the MDI-C ($p = .019$, partial $\eta^2 = .019$) compared to control group. No significant difference found between the groups in relation to overall depression level scores on the MDI-C</p>

EYE MOVEMENT DESENSITIZATION AND REPROCESSING (EMDR)

Chemtob, Nakashima, & Carlson (2002)*	Randomized experimental design, waitlist delayed treatment control group, single-blinded, pretest + posttest, 6-month follow-up	Hurricane (USA)	32 children (69% female) who did not improve after phase 1 treatment; all children met criteria for PTSD; 17 children assigned to treatment, 15 children assigned to waitlist; ages 6-12 years ($M = 8.4$ years)	Manual-based Eye Movement Desensitization and Reprocessing (EMDR) treatment; individual treatment; 1 diagnostic session + 3 weekly treatment sessions Instructors: Doctoral level clinicians trained in EMDR	KRI; CRI; RCMAS; CDI	Significant pre-treatment versus 6-month follow-up differences on CRI ($p < .0009$, Cohen's $d = 2.04$), RCMAS ($p < .0009$, Cohen's $d = 1.07$), and CDI ($p < .0009$, Cohen's $d = .69$). Treatment effects do not appear to be due to mere passage of time.
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MIND-BODY SKILLS

Gordon, Staples, Blyta, Bytyqi, & Wilson (2008)	Randomized experimental design, waitlist delayed intervention control group, pretest-posttest, 3-month follow-up of experimental	War (Kosovo)	82 adolescents (76% female) meeting PTSD criteria; 41 adolescents randomly assigned to immediate intervention group, 41 adolescents randomly	Group therapy (format was manualized following the study); mind-body techniques + self-expression (guided imagery, relaxation techniques, meditation, autogenic training, biofeedback, genograms, drawing, writing, dancing);	HTQ	Immediate intervention group had significantly lower PTSD symptom scores than waitlist control group at post-intervention ($p < .001$, partial $\eta^2 = .282$). Symptom reduction was maintained at 3-month follow-up.
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	group	assigned to waitlist control group; ages 14-18 years ($M= 16.3$ years)	approx. 10 adolescents per group; 12 sessions (2 hours per week for 6 weeks) Instructors: Teachers trained in the program
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* Indicates that the study was included in one or more of the review articles.

** Indicates that the effect size was not reported in the article. Therefore, the effect size was estimated using the formula presented in section 2.5.

Abbreviations: BASC-PRS = Behavioral Assessment for Children- Parent Rating Scales; CAS-P = Children’s Aggression Scale- Parent Version; CDI = Children’s Depression Inventory; CDIS = Child Diagnostic Interview Schedule; ChIA = Children’s Inventory of Anger; CHS = Children’s Hope Scale; CMHC = Children’s Mental Health Checklist; CPSS = Child PTSD Symptom Scale; CPTSD-RI = Child Posttraumatic Stress Disorder- Reaction Index; CRI = Child Reaction Index; CSRS = Child Self-Rating Scale; DEQ = Disaster Experience Questionnaire; DICA-R = Diagnostic Interview for Children and Adolescents-Revised; DPS = Diagnostic Predictive Scales; DSRS = Birleson Depression Self-Rating Scale; FPC = Filial Problem Checklist; FSSC = Fear Survey Schedule for Children; GSS = Grief Screening Scale; HTQ = Harvard Trauma Questionnaire; KRI = Kauai Recovery Inventory; LES = Life Events Scale; MASC = Multidimensional Anxiety Scale for Children; MDI-C = Multiscore Depression Inventory for Children; MFQ-C = Mood and Feelings Questionnaire- Child Version; PSC = Pediatric Symptom Checklist; RBQ = Rutter Behavioral Questionnaire for Completion by Teachers; RCMAS = Revised Children’s Manifest Anxiety Scale; R-IES = Horowitz’s Revised Impact of Events Scale; SCARED = Screen for Child Anxiety Related Emotional Disorders; SCARED-5 = Screen for Child Anxiety Related Emotional Disorders 5-item version; SDQ = Strength and Difficulties Questionnaire; SSS = Self-Satisfaction Survey; TCRS = Teacher-Child Rating Scale; TDGS = Traumatic Dissociation and Grief Scale; TESI = Trauma Events Screening Inventory- Child Version Brief Form; UCLA-GI = UCLA Grief Inventory; UCLA-GI-R = UCLA Grief Inventory- Revised; UPID = UCLA PTSD Index for DSM-IV (revision of CPTSD-RI); WEQ = War Events Questionnaire; WTQ = War Trauma Questionnaire

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