AN EXAMINATION OF MEANING-MAKING PROCESSES IN TRAUMA-FOCUSED COGNITIVE BEHAVIORAL THERAPY FOR CHILDHOOD TRAUMA

by

Charlotte Beth Ready

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Psychology

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ABSTRACT

Clinical research has shown that cognitive components of overgeneralization are associated with Posttraumatic Stress Disorder (PTSD). Previous findings from treatment studies for adult PTSD suggest that cognitive shifts from overgeneralized to more balanced, accommodated beliefs are important change processes in PTSD treatment. Conversely, avoidance has been identified as an inhibitor of symptom improvement. It is not yet clear whether: 1) change in both overgeneralization and new beliefs (accommodation) are required for symptom change, 2) change in overgeneralization or accommodation alone is sufficient, or 3) whether chronic avoidance exacerbates the negative effects of overgeneralization. Previous research has not examined predictors of long-term change and has focused only on adult populations. This study examined the relationships between overgeneralization, accommodation, avoidance, and symptom reduction in a sample of 81 youth (age 7-17 years) receiving Trauma-Focused Cognitive Behavioral Therapy. Overgeneralization, accommodation, and avoidance expressed during the exposure phase of treatment were coded in audio-recorded therapy sessions. Overgeneralization, accommodation, avoidance, and their interactions were examined as predictors of symptoms at treatment and the follow-up period. Interaction findings revealed that overgeneralization was associated with higher posttreatment internalizing problems,
but not when accommodation was high or when avoidance was low.

Overgeneralization also predicted a worsening of externalizing symptoms over the follow-up period, but accommodation again reduced this effect and avoidance worsened this effect. These findings suggest that overgeneralization might inhibit therapeutic change in youth with PTSD, but the elicitation of accommodated beliefs and reduction of avoidance may buffer these negative effects.
Chapter 1

INTRODUCTION

Meaning-making is defined as the process of resolving disturbance or conflict between disruptive or traumatic life experiences and an individual’s preexisting belief system. Successful meaning-making attempts, in which some adaptive resolution is achieved, have been shown to be associated with better emotional and social adjustment and fewer symptoms of psychopathology (e.g., Park, 2010). Treatments for Posttraumatic Stress Disorder (PTSD), a condition theorized to be an interruption in this natural process of meaning-making, place an emphasis on helping individuals process and make sense of their traumatic experiences (e.g., Cohen, Mannarino, & Deblinger, 2006; Foa, Huppert, & Cahill, 2006; Resick & Schnicke, 1993). Recent theory and research suggest that the process of meaning-making represents new learning, in which traumatic experiences and preexisting beliefs are integrated into new, balanced, and more realistic perspectives (e.g., Craske et al., 2012; Park, 2010). This new learning is hypothesized to be a particularly important component of successful treatment outcome and relapse prevention (Craske et al., 2012). Consequently, knowledge of factors that interfere with successful meaning-making has important implications for the dissemination and implementation of PTSD treatments. Initial research has identified treatment strategies and clinician behaviors
that can facilitate or interfere with the meaning-making process (e.g. Abramowitz & Arch, 2014; Craske et al., 2012), but few studies have directly examined client-related factors that can inhibit this process. Overgeneralized fear responses, which have been shown to be key contributors to the development and maintenance of anxiety disorders, may also be an important client-level inhibitor of meaning-making and recovery from PTSD and anxiety-related disorders (e.g., Bouton, 2000; 2004; Craske, et al., 2008; Foa, Huppert, and Cahill, 2006).

Although most research has focused on the behavioral components of overgeneralization and fear conditioning, recent theory and research suggest that cognitive components of overgeneralization may be just as important (e.g., Kleim et al., 2013; Sobel, Resick, and Rabalais, 2009; Zalta et al., 2013). Cognitive overgeneralization is defined as global, exaggerated beliefs that are inappropriately applied across a wide range of events (e.g., Moore & Zoellner, 2007; Watkins, Baeyens, & Read, 2009). For instance, a girl who was sexually abused at school by a bearded man might generalize from this specific situation to fear all men with beards and buildings that look like schools. Cognitive overgeneralization has been consistently identified as an important predictor of depression, and although the findings are mixed, there is some evidence to suggest that this cognitive process might also be involved in anxiety disorders (e.g., Ganellen, 1988; MacLeod & Williams, 1990).

Recent clinical research has shown that cognitive overgeneralization is associated with more PTSD symptom severity (Moore & Zoellner, 2007) and with
worse treatment progress and outcomes in adult populations with PTSD (Sobel, Resick, & Rabalais, 2009). Cognitive overgeneralization has not been examined as it changes over the course of treatment, and its long-term effects and role in child PTSD populations have not been investigated. The current study examined the effects of cognitive overgeneralization in a sample of underserved youth engaged in Trauma-Focused Cognitive Behavioral Therapy for PTSD symptoms related to sexual and physical abuse, domestic and community violence, and traumatic loss.

Overgeneralization in Posttraumatic Stress Disorder

Cognitive overgeneralization has been studied most often in depression, and there is robust evidence of a strong relationship between overgeneralization and depression symptoms in clinically depressed and nonclinical samples (Watkins et al., 2009; Watkins, Moberly, & Moulds, 2008). Early research findings indicated little support for a relationship between cognitive overgeneralization and anxiety disorders (e.g., Ganellen, 1988). Recent findings, however, suggest that overgeneralization is associated with trait anxiety in children and adolescents (Weems, Berman, Silverman, & Saavedra, 2001), intrusive memories in a PTSD analogue study (Schaich, Watkins, & Ehring, 2013), and PTSD symptoms in adults, even when controlling for comorbid depression (McNally, Lasko, Macklin, & Pitman, 1995). In individuals with PTSD, overgeneralization typically occurs when a component of the traumatic experience is
taken out of context and applied broadly across most situations (e.g., people are untrustworthy, the world is dangerous, I am incompetent).

In a review of the overgeneralization literature, Moore and Zoellner (2007) identified numerous studies showing no relationship between trauma exposure alone and overgeneralization. The authors suggest that it is overgeneralization that occurs in response to trauma, rather than the trauma itself, that is associated with the development and maintenance of PTSD symptoms. They further conclude that overgeneralization may differentiate those who develop PTSD from those who are more resilient. Consistent with this, negative global beliefs about the self, world, and future (which can be conceptualized as cognitive overgeneralization) differentiated trauma-exposed individuals who met diagnostic criteria for PTSD from those who did not (Ali, Dunmore, Clark, & Ehlers, 2002). These negative beliefs also mediated the relationship between traumatic experiences and PTSD symptoms (Elwood, Mott, Williams, Lohr, & Schroeder, 2009) and the relationship between lack of social support (an established risk factor) and PTSD symptoms (Belsher, Ruzek, Bongar, & Cordova, 2012). Together, these findings indicate that overgeneralized beliefs following trauma exposure are likely to contribute to the development and maintenance of PTSD symptoms.

Similar results have been reported in the context of PTSD treatment studies. Trauma-related overgeneralization is directly targeted in Cognitive Processing Therapy (CPT; Resick and Schnicke, 1993), a cognitively-based treatment for PTSD. Individuals receiving CPT write essays about the traumatic experience, including its
cause and the overall impact on their lives, at the beginning and end of treatment. Sobel, Resick, and Rabalais (2009) coded these essays for ‘overaccommodated’ beliefs that capture overgeneralization (defined as exaggerated, global, overgeneralized beliefs about self, others, and the world) and ‘accommodated’ beliefs (defined as adaptive, balanced beliefs about self, others, and the world). Participants showed significant pre- to post-treatment decreases in overaccommodated beliefs, which were associated with concurrent decreases in PTSD symptoms. Overaccommodated beliefs have also been shown to be correlated with more PTSD symptoms at pre-treatment, post-treatment, and one year follow-up assessments (Owens, Pike, & Chard, 2001). Although these studies do not demonstrate that changes in overaccommodation precede symptom reduction, they do highlight the role of overgeneralized beliefs in PTSD.

In addition to these concurrent associations, Kleim et al. (2013) reported that session-by-session decreases in overgeneralized beliefs predicted subsequent decreases in PTSD symptoms during Cognitive Therapy, whereas change in PTSD symptoms did not predict subsequent change in beliefs. This same pattern of findings has been reported in Prolonged Exposure (PE), a behaviorally-based exposure treatment for PTSD (Zalta et al., 2013). Together, these findings highlight overgeneralized beliefs as an important target of change in cognitive-behavioral treatments for PTSD. It is important to note that these two studies measured overgeneralized beliefs using the Post-Traumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999), a 33-item measure that assesses
overgeneralized beliefs but that also includes five items about self-blame for the traumatic event (which is a cognitive distortion specific to that event rather than applied globally). Although these findings suggest that it is important to target negative beliefs when treating PTSD, the unique role of overgeneralization is not yet clear.

Inhibiting Cognitive Overgeneralization with New, Balanced Beliefs

Traditionally, a primary mechanism through which therapy was hypothesized to facilitate meaning-making and recovery from PTSD was by weakening maladaptive, overgeneralized associations between trauma reminders, feelings of anxiety, and beliefs about self, others and the world. More recently, behavioral research on extinction learning has demonstrated that extinction of these anxiety-based associations alone is not sufficient for sustainable change. Rather, direct focus on strengthening new learning is needed to inhibit the old, fear-based learning from re-emerging (e.g., Bouton, 2000, Foa, et al., 2006; Lissek, 2012).

Findings from cognitively-oriented research indicate that these principles also apply to overgeneralized beliefs. In a study of preassault beliefs, Ali et al. (2002) reported higher levels of positive preassault beliefs in those who did not develop PTSD compared to those who did. Despite limitations of the retrospective design, these findings provide preliminary support for the notion that adaptive cognitions may buffer against the development of PTSD symptoms. In addition to finding that
overaccommodation decreased by the end of a course of CPT, Sobel et al. (2009) reported that accommodation (adaptive, balanced beliefs that result from meaning-making) also increased. Furthermore, both types of cognitive change were associated with improvement in PTSD symptoms, although the design did not shed light on the temporal precedence of cognitive change in relation to symptom improvement and whether both old and new learning contributed uniquely to long-term outcomes.

Overgeneralization, New Learning, and PTSD in Children and Adolescents

Although preliminary findings indicate that overgeneralization may play an important role in the development and maintenance of adult PTSD, little is known about overgeneralization in children and adolescent PTSD. Similar to findings in adult PTSD, Palosaari and colleagues’ (Palosaari, Punamaki, Diab, & Quota, 2013) reported that, in a sample of war-exposed Palestinian children, changes in overgeneralization and self-blame (child-version of the PTCI) from 3 to 5 months after trauma exposure predicted subsequent changes in PTSD symptoms 5 to 11 months later. Changes in PTSD symptoms, on the other hand, did not predict changes in cognitions. Although the children in this sample were not receiving treatment, these findings suggest that overgeneralized beliefs may also maintain child PTSD symptoms and that overgeneralization might be an important target in treatment. Related to this, overgeneralization has been shown to be strongly associated with trait anxiety and anxiety sensitivity in children and adolescents (Weems et al., 2001).
Few studies have directly examined the association between overgeneralization and treatment outcome in childhood PTSD, but the processes of overgeneralization and new learning are likely to be as important in treatment and recovery from childhood PTSD as they are in adult PTSD. Trauma-Focused Cognitive Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006), one of the most widely studied and efficacious treatments for childhood PTSD (e.g., Deblinger, Steer, & Lippmann, 1999; Silverman et al., 2008), provides a useful context for studying changes in overgeneralization and new learning because it is similar to adult interventions that involve gradual exposure and processing of these memories. TF-CBT facilitates processing by having youth recount their traumatic experience(s) and explore trauma-related beliefs in session. Despite the evidence regarding the efficacy of TF-CBT, relatively little is known about how this treatment facilitates change.

Findings from a recent dismantling study (Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011) suggest that the narrative component seems to reduce fear-related trauma responses and that providing additional skills-based aspects of TF-CBT, including parenting skills, in place of the narrative helps to reduce externalizing symptoms. These differences between the narrative and no-narrative/augmented skills-building groups were no longer significant over the one-year follow-up period. (Mannarino, Cohen, Deblinger, Runyon, & Steer, 2012). Even though cognitive change was not directly examined, Mannarino et al. (2012), speculate that TF-CBT, with or without the narrative, might facilitate cognitive change because both involve some degree of exposure to the traumatic memories.
Avoidance Maintains Overgeneralization and PTSD Symptoms

In addition to facilitating new learning and meaning-making, the trauma narrative task in TF-CBT might help to counter the pervasive avoidance that characterizes PTSD. Avoidance is associated with worse symptomatology across a range of anxiety disorders (Boulanger, Hayes, & Pistorello, 2010; Maack, Tull, & Gratz, 2012; Polusney, & Follette, 1995), is a particularly strong predictor of PTSD symptoms, and is a key contributor to the association between child maltreatment and PTSD symptoms in youth (Shenk, Putnam, & Noll, 2012; Shenk, Putnam, Rausch, Peugh, & Noll, 2014). Avoidance is a better predictor of PTSD symptoms than trauma severity or physiological markers of emotional arousal (Plumb, Orsillo, Luterek, 2004; Shenk, Putnam, & Noll, 2012; Shenk, Putnam, Rausch, Peugh, & Noll, 2014). In addition, avoidance can worsen PTSD symptoms when it co-occurs with trauma-related physiological reactivity (Pineles et al., 2011).

Avoidance, which has been associated with low distress tolerance, can provide short-term escape or relief from distressing thoughts and feelings. In the long-term, however, avoidance interferes with the processing of traumatic events and is associated with worse long-term functioning (Fetzner, Peluso, & Asmundson, 2014; Kross & Ayduk, 2008; Many, Hansel, Moore, Rosenberg, & Osofsky, 2012). Learning theory identifies chronic avoidance as an inhibitor of meaning-making and a factor that maintains and strengthens the initial, maladaptive fear associations (e.g. Craske et al., 2012; Foa et al., 2006, Gillihan & Foa, 2014). Similar associations between
avoidance and long-term symptoms have been identified in youth up to six years after discovery of sexual abuse (Simon, Feiring, & McElroy, 2010). Results from a series of studies demonstrated that experiential avoidance mediated the relationship between child maltreatment and the development of youth PTSD symptoms one year later (Shenk et al, 2012; 2014). Shenk et al. (2014) conclude that the way victimized youth relate to distressing thoughts and feelings may be more important than the mere presence of those internal experiences. Thus, the ability to engage distressing, trauma-related beliefs and feelings may facilitate new learning and provide opportunities to develop more balanced beliefs.

Trauma research has also differentiated “functional avoidance” and “dysfunctional avoidance” (e.g., Bonanno, Keltner, Holen, & Horowtiz, 1995; Many, Hansel, Moore, Rosenberg, & Osofsky, 2012). Functional avoidance is viewed as a natural part of the recovery process for many trauma survivors (Many et al., 2012) and refers to the fluctuation between intentional engagement and short-term disengagement with distressing internal experiences to promote gradual exposure to trauma-related thoughts and feelings as well as optimal functioning in the immediate trauma aftermath. Similar patterns have also been identified in youth (Elzy, Clark, Dollard, & Hummer, 2013). It is possible that avoidance may not be problematic when used in this way to self-titrater engagement with distressing trauma-related thoughts and feelings but can become problematic if used as a long-term strategy to escape or suppress distressing internal experiences.
Together, these findings suggest that high levels of avoidance may be particularly harmful when paired with overgeneralization, as avoidance prevents the individual from encountering new experiences to disconfirm overgeneralized beliefs, interferes with new learning and meaning-making, and can strengthen overgeneralized beliefs. The trauma narrative component of TF-CBT might be a useful tool for reducing avoidance, increasing engagement with overgeneralized beliefs, and providing the opportunity for new learning and successful meaning-making (e.g., accommodation). However, youth who continue to engage in avoidance throughout the narrative phase of treatment may maintain, and even strengthen, their overgeneralized beliefs and short-circuit the recovery process.

Study Aims

In youth PTSD treatment literature, as in the adult PTSD treatment literature, it is not yet clear whether: 1) overgeneralization and new beliefs (accommodation) are associated with treatment outcome, 2) change in both overgeneralization and new beliefs (accommodation) are required for symptom change, 3) change in the pathological thinking alone is enough or whether only new learning, without changing the old, is enough to inhibit the tendency to overgeneralize, and (5) whether chronic avoidance exacerbates the negative effects of overgeneralization. Previous research has not parsed these types of learning during the course of treatment and has not
examined the long-term effects of such change. In addition, research to date has focused only on adult populations.

The aims of the current study are to:

1. Examine the relationship between overgeneralized and accommodated (balanced) beliefs and symptom change at post-treatment and over one-year follow up in youth receiving TF-CBT in community settings. Youth sessions from the trauma narrative phase of treatment were coded for overgeneralization and accommodation to capture these cognitive processes as they unfold over the course of the trauma narrative. Overgeneralization and accommodation were examined as predictors of PTSD symptoms, internalizing problems, and externalizing behaviors measured at pretreatment, mid-treatment, post-treatment, 9-month follow-up, and 1 year follow-up. To examine whether overgeneralization or accommodation alone or in combination were associated with symptom improvement, their main effects and interaction were examined.

2. Examine the relationship between overgeneralized beliefs, avoidance, and symptom change at post-treatment and over one-year follow up. Overgeneralization and avoidance were examined as predictors of PTSD symptoms, internalizing problems, and externalizing behaviors measured across treatment and the 1 year follow-up. To examine whether avoidance strengthens the maladaptive impact of overgeneralization, the interaction between avoidance and overgeneralization was examined as a predictor of symptom outcomes.
Chapter 2

METHOD

Participants

Study referrals were initially screened over the phone for eligibility. Youth were excluded if caregivers reported that: 1) the child had an intellectual disability or untreated psychosis or current substance abuse, 2) required frequent hospitalizations or a higher level of care, or 3) a sibling was already in the study. Youths were between the ages of 7 and 17, English-speaking, and qualified for publicly-funded treatment. They also had to have a legal guardian who was English-speaking and willing to co-participate in treatment and a year-long follow-up. Qualified youth were administered the UCLA PTSD Reaction Index for DSM-IV-Abbreviated (UPID-A) at their residence. Those scoring 17 or more on the UPID-A or endorsing 3 of 9 PTSD symptoms based on an independently verified (e.g., through child welfare) trauma were included in the study.

One hundred and nine participants met inclusion criteria. Participants were mostly female (63%), racially diverse (47% White, 44% African-American, 5% Hispanic/Latino, and 4% Biracial), and ranged from 7-17 years of age ($M=12.69$; $SD=2.8$). Nearly a third (26%) of the sample was in foster care. Children reported an
average of 3.4 types of trauma ($SD=1.71$) in their lives, including sexual abuse (47%), physical abuse (54%), domestic violence (52%), traumatic loss of a loved one (54%), community violence (experienced: 27%; witnessed: 34%), car accident or other traumatic accident (24%), fire (5%), witnessing a disaster (9%), or other abuse (11%). According to the UCLA PTSD Reaction Index, 64% of the participants had full PTSD, 17% met criteria for partial PTSD (i.e., met criteria for two of the three symptom clusters: re-experiencing, avoidance or hyperarousal), and 19% showed elevated symptom severity scores but met criteria for one or fewer symptom clusters. Only the 81 youth who completed at least one session in the trauma narrative phase of treatment were included in the current study.

**Measures**

On the basis of a review of 435 randomized control trials for childhood mental health problems, Becker, Chorpita, & Daleiden (2011) recommend using broadband measures of youth functioning over symptom-specific measures to best capture therapeutic change over the course of treatment. In addition to broadband measures of internalizing and externalizing functioning, the current study also included a symptom-specific measure to directly examine changes in PTSD symptoms over time.
Broadband measures of functioning.

The *Child Behavior Checklist (CBCL)* is a 113-item parent-report measure that assesses a range of child emotional and behavioral problems. Items are rated on a 3-point Likert scale (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or often true*). The current study focused on the Internalizing and Externalizing scales to provide a measure of broad symptom change over time. Raw scores were used in all analyses, as T-scores can truncate the range of data and be less sensitive to gradual changes in symptom trajectories over the course of treatment and the follow-up (Achenbach, 1991). The CBCL is a well-established measure with good reliability and validity as a measure of mental health problems in children (Achenbach, 2001). In the current sample, reliability across treatment and follow-up was excellent for the Internalizing scale (Cronbach’s α = .89 to .90) and for the Externalizing scale (Cronbach’s α = .92 to .95).

Symptom-specific measure of PTSD.

The *UCLA PTSD Reaction Index for DSM-IV (UPID)* was used to assess changes in PTSD symptoms. The UPID, administered as a questionnaire or structured interview, inventories 13 types of trauma, assesses objective and subjective aspects of the most bothersome trauma, and includes questions about the frequency of re-
experiencing, avoidance, and hyperarousal symptoms in children ages 7-18. In past work, test-retest reliability was 0.84, and the UPID showed good convergent validity, sensitivity (0.93), and specificity (0.87) in diagnosing PTSD (Steinberg et al., 2004). The full version was used to measure symptom level and change at pre-treatment, mid-treatment, post-treatment, and 9-month and 1 year follow-up. An abbreviated version (only 23 items) was used for initial screening. The UPID demonstrated good reliability in this sample across treatment and follow-up (Cronbach’s $\alpha = .87$ to .90).

Therapists

Therapists included 25 clinicians who either held a professional degree or were doctoral students in clinical psychology programs. Clinicians were either licensed or supervised by a licensed practitioner. A majority of the therapists were Caucasian women (84%), although one clinician identified as Asian, one as Latina, and two clinicians were Caucasian males.

Trauma Focused Cognitive Behavioral Therapy (TF-CBT)

TF-CBT is an evidence-based treatment for children, adolescents and their non-offending caregivers that is designed to address PTSD, depression, and other trauma-related behavioral difficulties. TF-CBT has been successfully applied to a wide range of childhood traumas, including sexual abuse, physical abuse, domestic violence, and traumatic loss. TF-CBT includes an emphasis on both exposure and
cognitive restructuring, with a third of treatment typically devoted to gradual exposure
to traumatic memories through the creation and processing of a narrative. The
structure of TF-CBT can be divided into three phases:

The stabilization and skills building phase focuses on therapeutic engagement
and psychoeducation about the prevalence, impact, and treatment (i.e. TF-CBT) of the
traumatic event(s) experienced as well as coping skills for managing emotional
distress. The therapist also works directly with the caregiver to provide education,
strategies, and feedback for assisting the child by learning, modeling and encouraging
the practicing of the coping skills learned in session.

The trauma narration and processing phase of therapy focuses directly on
gradual exposure to traumatic memories through the creation of a narrative. During
this phase, the therapist and child work together to identify and challenge maladaptive
beliefs about the traumatic event, its meaning, and its consequences.

The consolidation and closure phase of treatment helps to consolidate and
integrate learning from previous sessions through in vivo mastery activities when
needed, trauma-focused parent-child conjoint sessions to share the narrative when
clinically appropriate, and the development of personal safety skills to support the
child's future development. Skill building in this phase often includes assertiveness
training, creating and rehearsing safety plans, and personal safety skills to prevent
revictimization.
Session Coding

Therapy sessions during the trauma narrative phase of TF-CBT (Mean trauma narrative sessions completed = 5.1, SD = 2.1) were coded for accommodation, overgeneralization, and avoidance using an extended version of the Change and Growth Experiences Scale (CHANGE; Hayes, Feldman, and Goldfried, 2007). Two variables, overgeneralization and accommodation, were adapted for use in child therapy sessions from the Impact Statement Coding System, which was originally developed by Sobel et al., (2009) to examine processes of change in Cognitive Processing Therapy for adult PTSD. All codes were rated on a continuous scale to capture absent to very low (0), low (1), medium (2), and high (3) levels of these variables. Variables are not mutually exclusive and can co-occur.

Accommodation captures the extent to which the person shows a clear, balanced view of self, others, or the world. Overgeneralization captures global, exaggerated beliefs of self, others, or the world, which typically result from inappropriately applying information from the traumatic event across most life situations. Avoidance captures unwillingness, hesitation, or difficulty engaging or remaining in contact with aversive emotions, thoughts, traumatic memories, or somatic sensations. Detailed descriptions and examples of each category are provided in Table 1.
<table>
<thead>
<tr>
<th>Coding Category</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accommodation</strong></td>
<td>Balanced views of self, others, or the world. This includes altering pre-existing beliefs and incorporating information from the traumatic experience to arrive at more realistic and accurate beliefs and the degree of realistic closure, acceptance, or resolution provided by these new beliefs.</td>
<td><em>From an 8-year old girl (sexual abuse):</em> “I felt like it [the sexual abuse] was my fault, but now I know it’s not my fault. He did it, he started it. It feels ok, it feels like it’s not my fault. I’m the good guy, he’s the bad guy. I think it [negative affect] is going to get better and better.”</td>
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<td></td>
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<td><em>From an 11 year old boy (recurrent physical abuse):</em> “As I face the memory, it starts to go away. She [abuser] doesn’t get the right to abuse me, it’s not ok to beat a child….I just say to myself the past is over and all the bruises went away. I’m in a safe place now. I have a scar on my heart, but it’s healing.”</td>
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<tr>
<td><strong>Overgeneralization</strong></td>
<td>Global, exaggerated beliefs of self, others, or the world. Instead of integrating information from the traumatic experience to arrive at a clear and balanced view, the person alters his or her beliefs to better match the information from the traumatic experience. This often results in inappropriately generalizing information from the traumatic event across most life situations.</td>
<td><em>From an 8 year old girl (sexual abuse):</em> “Guys scare me because of what happened with my cousin [the abuser]. I get scared when guys come into the house, I get scared that it [sexual abuse] will happen again.”</td>
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<td></td>
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<td><em>From an 11 year old boy (recurrent physical abuse):</em> “My aunt [the abuser] left a scar on my heart that will never heal. I just can’t take the pain anymore, I have had so much pain all my life.”</td>
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<tr>
<td><strong>Avoidance</strong></td>
<td>Unwillingness, hesitation, or difficulty engaging or remaining in contact with aversive emotions, thoughts, traumatic memories, or somatic sensations. This category includes attempts to minimize, escape, or prevent aversive experiences through strategies such as denial, distraction, withdrawal, “shutting down,” or emotional numbing.</td>
<td><em>During the writing of the trauma narrative with a 15 year old boy experiencing traumatic grief after the murder of his father is:</em> “Me and mom went to North Carolina for my dad’s funeral. I looked at dad in his coffin. There were a few announcements made at the funeral. After the funeral me and mom went to the hotel, went to sleep, and left to go back home.” He provides very few details in the narrative, no details regarding aversive emotions, thoughts, or distressing aspects of his experience. As the therapist probes for more details, the client responds with “I don’t know,” attempts to change the conversation, and attempts to crack jokes instead of engaging with the trauma narrative and associated feelings of anxiety, anger, and grief.</td>
</tr>
</tbody>
</table>
Coders

A team of 19 coders rated all sessions from the trauma narrative phase of treatment for overgeneralization, accommodation, and avoidance. Two coders rated each session, and coding pairs were rotated. Coders were trained to criterion and met as a group each week to prevent rater drift and to reach consensus on coding discrepancies of more than one point on the 4-point coding measure. Interclass correlation coefficients (ICC) were calculated on the raw coding (before consensus) for 25% of the total sample, and all coding categories were in the acceptable to good range of agreement (ICC accommodation=.71; ICC overgeneralization=.69; ICC avoidance = .70; Shrout & Fleiss, 1979). Consistent with this, the percent agreement within 1 point across all sessions was 93% for accommodation, 94% for overgeneralization, and 89% for avoidance. The ratings of the two coders per transcript were averaged, and these averaged ratings were used in all analyses.
Chapter 3

RESULTS

Data from the 81 youth who completed at least one trauma narrative session were analyzed with piecewise latent growth curve modeling using Hierarchical Linear Modeling 7 software (HLM 7; Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). Descriptive statistics and correlations for study variables are provided in Table 2.
<table>
<thead>
<tr>
<th>Measure</th>
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**Table 2**

Correlation matrix and descriptive statistics of study variables.
Symptom Change Over Treatment and Follow-Up

Initial piecewise analyses were first conducted to examine level-1 within-person symptom reduction from pre- to post- treatment (Time A: 0, 3, and 6 months) and from post-treatment through 12 month follow up (Time B: 6, 9, and 12 months), consistent with recommendations from Flora (2008) and implemented in Young et al. (2010). The resulting level-1 equation includes two time pieces that represent the time periods of interest:

\[ OUTCOME_{it} = \beta_{0i} + \beta_{1i}(TIMEA_{it}) + \beta_{2i}(TIMEB_{it}) + r_{iti} \]

In this equation, \( OUTCOME_{it} \) is the observed value of symptoms at time \( t \) within youth \( i \). \( \beta_{0i} \) represents youth \( i \)'s symptom level at pre-treatment (time=0); \( \beta_{1i} \) and \( \beta_{2i} \) represent the rate of linear change in symptoms over TimeA (treatment) and TimeB (follow-up period) for youth \( i \); and \( r_{iti} \) represents within-individual variance in youth \( i \)'s symptoms not accounted for by pre-treatment symptoms or by linear change in symptoms. Intercepts and slopes were allowed to vary, allowing the model to estimate intercepts and rate of symptom change for each individual. Average betas are reported as fixed effect \( \gamma \)s. In addition, these random intercepts and random slope terms were allowed to correlate by fitting a covariance between the terms. In a linear case, positive covariance indicates that participants with higher levels at baseline (intercept)
have steeper rates of change (more positive). Negative covariance indicates that participants with lower levels at baseline (intercept) have steeper rates of change. Similar conclusions can be made with piecewise analyses.

There was a significant reduction in PTSD symptoms ($\gamma = -2.55$, $SE = .29$, $p < .001$), internalizing problems ($\gamma = -.98$, $SE = .15$ $p < .001$), and externalizing behaviors ($\gamma = -.76$, $SE = .21$, $p < .001$) from pre- to post-treatment. Improvements in PTSD (see Figure 1) and internalizing symptoms were maintained over the 6-, 9-, and 1 year follow-up period, but there was a significant increase in externalizing behaviors ($\gamma = .65$, $SE = .27$, $p = .018$, see Figure 2).

**Figure 1** The average baseline score (intercept) and trajectory of symptom change across the treatment and follow-periods for PTSD symptoms (self-report UPID scores). These scores represent the average intercept and slope across all youth. $\gamma$ = unstandardized regression coefficient, representing the slope or rate of symptom change. *** $p \leq .001$. 

---

24
Overgeneralization and Accommodation as Predictors of Symptom Change

Overgeneralization, accommodation, and their interaction were examined as predictors of the significant decrease in symptoms on all outcome measures over the treatment phase and the significant increase in externalizing behaviors over the follow-up period. Because treatment gains in PTSD and internalizing symptoms were maintained over the follow-up period (non-significant within-person change) and the variance estimates of these slopes were also not significant (indicating minimal between-person differences), predictors of PTSD and internalizing symptoms over the follow-up period were not examined.
Consistent with previous studies of anxiety-related cognitions in youth (e.g., Weems et al., 2001), overgeneralization was significantly correlated with child age ($r = .27, p = .016$) in the current study. Age was therefore entered as a covariate in all analyses. The resulting Level-2 equations include cognitive processes and their interaction as predictors of the slope for each time piece, controlling for pretreatment symptoms and child age:

**Post-Treatment Outcome (Intercept):**

$\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{PRETREATMENT SYMPTOMS}_i) + \gamma_{02}(\text{CHILDAGE}_i) + \gamma_{03}(\text{OVERGENERALIZATION}_i) + \gamma_{04}(\text{ACCOMODATION}_i) + \gamma_{05}(\text{OVERGENERALIZATION} \ast \text{ACCOMODATION}_i) + u_{0i}$

**TimeA (Treatment) Slope:**

$\beta_{1i} = \gamma_{10} + \gamma_{11}(\text{PRETREATMENT SYMPTOMS}_i) + \gamma_{12}(\text{CHILDAGE}_i) + \gamma_{13}(\text{OVERGENERALIZATION}_i) + \gamma_{14}(\text{ACCOMODATION}_i) + \gamma_{15}(\text{OVERGENERALIZATION} \ast \text{ACCOMODATION}_i) + u_{1i}$

**TimeB (Follow-up) Slope:**

$\beta_{2i} = \gamma_{20} + \gamma_{21}(\text{PRETREATMENT SYMPTOMS}_i) + \gamma_{22}(\text{CHILDAGE}_i) + \gamma_{23}(\text{OVERGENERALIZATION}_i) + \gamma_{24}(\text{ACCOMODATION}_i) + \gamma_{25}(\text{OVERGENERALIZATION} \ast \text{ACCOMODATION}_i) + u_{2i}$

$\beta_{0i}$ represents individual symptom levels at post-treatment (6 Months), and the coefficient $\gamma_{00}$ estimates the average symptom level at post-treatment. The coefficients $\gamma_{01}, \gamma_{02}, \gamma_{03}$, and $\gamma_{04}$ represent the shift in post-treatment symptoms as pretreatment symptoms, child age, overgeneralization, and accommodation increase. The term $\gamma_{05}$ represents the interaction (overgeneralization $\ast$ accommodation) as a predictor of post-treatment symptoms. $\beta_{1i}$ and $\beta_{2i}$ represent individual rates of linear change in
symptoms over the course of each time period. The coefficients $\gamma_{10}$ and $\gamma_{20}$ estimate the average rate of change in symptoms over the corresponding time period ($\gamma_{10}$: treatment; $\gamma_{20}$: follow-up). The coefficients $\gamma_{11}$, $\gamma_{12}$, $\gamma_{13}$, $\gamma_{14}$ and $\gamma_{21}$, $\gamma_{22}$, $\gamma_{23}$, $\gamma_{24}$ represent the shift in the rate of symptom change as pretreatment symptoms, child age, overgeneralization, and accommodation increase. The terms $\gamma_{15}$ and $\gamma_{25}$ represent the interaction (overgeneralization * accommodation) as a predictor of the rate of symptom change. Intercepts and slopes were allowed to vary so that intercepts and rate of symptom change for each individual could be estimated. The findings from the piecewise hierarchical regressions are described below and presented in Table 3.

Table 3  
<table>
<thead>
<tr>
<th>Outcome</th>
<th>Independent Variable</th>
<th>$\gamma$</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internalizing</td>
<td>Treatment Outcome (6 months)</td>
<td>Baseline Internalizing</td>
<td>.37***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Child Age</td>
<td>-.16</td>
</tr>
<tr>
<td></td>
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<td>Overgeneralization</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Accommodation</td>
<td>-4.32**</td>
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<tr>
<td></td>
<td></td>
<td>Overgeneralization x Accommodation</td>
<td>-9.02**</td>
</tr>
<tr>
<td></td>
<td>Treatment (0, 3, 6 months)</td>
<td>Baseline Internalizing</td>
<td>-.09***</td>
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<tr>
<td></td>
<td></td>
<td>Child Age</td>
<td>-.01</td>
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<td></td>
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<td>Overgeneralization</td>
<td>.30</td>
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<td></td>
<td></td>
<td>Accommodation</td>
<td>-.58+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overgeneralization x Accommodation</td>
<td>-1.18+</td>
</tr>
</tbody>
</table>
Accommodation, overgeneralization, pretreatment symptoms, and child age were centered so that the variable means across all 81 youth were set to zero and interaction terms were calculated using centered variables. This approach allows for interpretation of the significance of main effects with the interaction terms in the model (Aiken & West, 1991). Following Preacher, Curran, and Bauer’s (2006) method, we dismantled significant interaction effects by examining significance of the

<table>
<thead>
<tr>
<th></th>
<th>Follow-Up Outcome (12 months)</th>
<th>Treatment (0, 3, 6 months)</th>
<th>Follow-up (6, 9, 12 months)</th>
<th>Treatment Outcome (6 months)</th>
<th>Treatment (0, 3, 6 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Externalizing</td>
<td>.58*** (.12)</td>
<td>-.08*** (.01)</td>
<td>.02 (.02)</td>
<td>.09 (.10)</td>
<td>-.13*** (.02)</td>
</tr>
<tr>
<td>Child Age</td>
<td>-.04 (.59)</td>
<td>-.06 (.07)</td>
<td>.05 (.08)</td>
<td>-.07 (.49)</td>
<td>-.04 (.09)</td>
</tr>
<tr>
<td>Overgeneralization</td>
<td>15.19*** (3.93)</td>
<td>-.32 (.41)</td>
<td>2.93*** (.60)</td>
<td>5.55+ (2.89)</td>
<td>.90+ (.52)</td>
</tr>
<tr>
<td>Accommodation</td>
<td>-2.80 (3.63)</td>
<td>-.56 (.40)</td>
<td>.19 (.54)</td>
<td>-5.92 (6.04)</td>
<td>-.77 (.52)</td>
</tr>
<tr>
<td>Overgeneralization x Accommodation</td>
<td>-24.95** (9.54)</td>
<td>-.80 (.85)</td>
<td>-3.15* (1.49)</td>
<td>-3.15+ (1.49)</td>
<td>-1.02 (1.09)</td>
</tr>
</tbody>
</table>

Note. + p <.10, * p <.05, ** p <.01, *** p <.001
conditional effects of the predictor variable on outcome by testing the simple slopes of participants with high levels (1 SD above the mean) and low levels (1 SD below the mean) of the moderator variable. Significance of these simple slopes was calculated using the variances and covariances of the independent variable, the moderator, and their interaction from the asymptotic covariance matrix. To dismantle the overgeneralization*accommodation interaction, significance of the conditional effects of overgeneralization on outcome was examined by testing simple slopes of youth with high (+1 SD) and low (-1 SD) levels of accommodation. The interaction terms were created by multiplying centered accommodation by centered overgeneralization.

**Internalizing symptoms.**

*Treatment Outcome.* A significant effect for accommodation indicated that higher levels of accommodation during the narrative phase of treatment were associated with lower levels of post-treatment internalizing symptoms. There was also a significant interaction effect, indicating that overgeneralization was associated with higher levels of internalizing symptoms at low ($\gamma =6.42$, $SE=2.62$, $p=.01$) but not high ($\gamma = -2.53$, $SE=2.34$, $ns$) levels of accommodation (see Figure 3).
Figure 3  Simple slopes showing the conditional association between overgeneralization and posttreatment internalizing symptoms at high (1 SD above the mean) and low (1 SD below the mean) levels of accommodation. Overgeneralization and accommodation are *grand-centered* so that a score of zero represents the average level of each variable across all 81 youth. $\gamma =$ unstandardized coefficient representing the simple slope of children with high and low levels of accommodation. ** $p \leq .01$. 
**Slope of Symptom Change Over Treatment.** There were no significant predictors of change in internalizing symptoms over the course of treatment. However, similar to treatment outcome findings, there was a trend toward a main effect for accommodation and toward the overgeneralization*accommodation interaction as predictors of greater change in internalizing symptoms over treatment.

**Externalizing behaviors.**

Given the significant increase in externalizing symptoms over the follow-up period, we were particularly interested in the 1 year follow-up endpoint and conducted a second analysis to examine this question in which $\beta_0$ was recoded to represent the 1 year follow-up endpoint instead of the post-treatment endpoint. The slope of change over treatment and follow-up, $\beta_1$ & $\beta_2$, are identical to the first analysis. To minimize redundancy, we report only the second piecewise equation ($\beta_0 = 1$ year follow-up endpoint) in Table 3.

**Treatment Outcome.** Higher levels of overgeneralization predicted higher externalizing symptoms at the 1 year follow-up assessment. Accommodation significantly moderated the relationship between overgeneralization and externalizing symptoms, such that overgeneralization was not associated with worse externalizing symptoms when accommodation was also high ($\gamma = 2.59$, SE=5.30, ns; low accommodation, $\gamma = 27.56$, SE=7.81, $p = .001$; see Figure 4).
Figure 4  Simple slopes showing the conditional association between overgeneralization and 1 year follow-up externalizing symptoms at high (1 SD above the mean) and low (1 SD below the mean) levels of accommodation. Overgeneralization and accommodation are grand-centered so that a score of zero represents the average level of each variable across all 81 youth. $\gamma =$ unstandardized coefficient representing the simple slope of children with high and low levels of accommodation. *** $p \leq .001$. 
**Slope of Symptom Change Over Treatment.** Neither overgeneralization, accommodation, nor their interaction emerged as significant predictors of change in externalizing behaviors during treatment.

**Slope of Symptom Change Over Follow-Up.** Similar to the treatment outcome findings, overgeneralization predicted greater increases in externalizing symptoms over the follow-up period. A significant overgeneralization* accommodation interaction indicated that overgeneralization was associated with greater increases in externalizing when accommodation was low ($\gamma = 4.49$, SE=1.23, $p = .001$) but not when accommodation was also high ($\gamma = 1.32$, SE=0.80, ns; see Figure 5).
Simple slopes showing the conditional association between overgeneralization and change in externalizing symptoms at high (1 SD above the mean) and low (1 SD below the mean) levels of accommodation. The y-axis represents the slope or rate of change in externalizing symptoms over the follow-up period. Negative scores represent a decrease in externalizing behaviors and positive scores represent symptom increases. Overgeneralization and accommodation are grand-centered so that a score of zero represents the average level of these variables across all 81 youth. $\gamma =$ unstandardized coefficient.
PTSD symptoms.

Neither overgeneralization, accommodation, nor their interaction predicted PTSD symptoms over the course of treatment, although there was a trend toward higher overgeneralization and lower accommodation as predictors of higher posttreatment PTSD scores. There was also a trend toward overgeneralization as a predictor of smaller reductions in PTSD symptoms over the course of treatment.

Overgeneralization and Avoidance as Predictors of Symptom Change

To examine avoidance as an inhibitor of change, the above analyses were repeated by entering overgeneralization, avoidance, and their interaction (overgeneralization*avoidance) as predictors of symptoms change, controlling for pretreatment symptoms and child age. Avoidance, overgeneralization, pretreatment symptoms, and child age were centered so that the variable means across all 81 youth were set to zero, and interaction terms were calculated using centered variables. Likewise, Preacher, Curran, and Bauer’s (2006) method was used to dismantle the overgeneralization*avoidance interaction by testing the significance of the conditional effects of overgeneralization on outcome by examining the simple slopes of youth with high (+1 SD) and low (-1 SD) levels of avoidance. The interaction terms were created by multiplying centered avoidance by centered overgeneralization. The findings from the piecewise hierarchical regressions are described below and presented in Table 4.
Table 4  Piecewise growth curve modeling examining overgeneralization, avoidance, and their interaction as predictors of change from pre- through post-treatment and post-treatment through 12 month follow-up

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<th>SE</th>
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<tr>
<td><em>Treatment Outcome (6 months)</em></td>
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</tr>
<tr>
<td>Baseline Internalizing</td>
<td>.37***</td>
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<tr>
<td>Child Age</td>
<td>-.07</td>
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<tr>
<td>Overgeneralization</td>
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<td>Avoidance</td>
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<td>.19</td>
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<td><strong>Externalizing Behaviors</strong></td>
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<tr>
<td><em>Follow-Up Outcome (12 months)</em></td>
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<tr>
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<td>.12</td>
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<tr>
<td>Child Age</td>
<td>.30</td>
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<tr>
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<td>4.7</td>
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<tr>
<td>Avoidance</td>
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<td>1.9</td>
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<td>Overgeneralization x Avoidance</td>
<td>10.53*</td>
<td>4.85</td>
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<tr>
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<tr>
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<td>Overgeneralization x Avoidance</td>
<td>.51</td>
<td>.42</td>
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<tr>
<td><em>Follow-up (6, 9, 12 months)</em></td>
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<td><strong>PTSD Symptoms</strong></td>
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<td><em>Treatment Outcome (6 months)</em></td>
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<tr>
<td>Baseline PTSD Symptoms</td>
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<td>Child Age</td>
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<td>.49</td>
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<tr>
<td>Overgeneralization</td>
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<td>2.89</td>
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<tr>
<td>Avoidance</td>
<td>-.83</td>
<td>1.83</td>
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</table>
Overgeneralization x Avoidance | 5.50⁺ | 3.04

| Treatment (0, 3, 6 months)                  |
|-----------------------------------------|------|------|
| Baseline PTSD Symptoms                  | -.13*** | .02  |
| Child Age                               | -.02  | .09  |
| Overgeneralization                      | .87   | .52  |
| Avoidance                               | -.08  | .33  |
| Overgeneralization x Avoidance          | .73   | .55  |

*Note.* p < .10, * p < .05, ** p < .01, *** p < .001

**Internalizing symptoms.**

*Treatment outcome.* There were no significant main effects for either overgeneralization or avoidance. However, a significant overgeneralization*avoidance interaction showed that overgeneralization was associated with higher posttreatment internalizing symptoms when avoidance was also high (γ = 5.12, SE=2.38, p = .03) but not when avoidance was low (γ = -1.81, SE=2.15, ns; see Figure 6).
Figure 6  Simple slopes showing the conditional association between overgeneralization and posttreatment internalizing symptoms at high (1 SD above the mean) and low (1 SD below the mean) levels of avoidance. Overgeneralization and avoidance are grand-centered so that a score of zero represents the average level of each variable across all 81 youth. \( \gamma \) = unstandardized coefficient representing the simple slope of children with high and low levels of avoidance. \( *p < .05 \).
Slope of change over treatment. Neither overgeneralization nor avoidance emerged as significant predictors of change in internalizing symptoms over the course of treatment. Similar to the treatment outcome findings, there was a trend toward the overgeneralization*avoidance interaction predicting less symptom change.

Externalizing behaviors.

Treatment outcome. Overgeneralization was associated with higher externalizing scores at the 1 year follow-up, and a significant overgeneralization*avoidance interaction showed that this relationship was significantly stronger when avoidance was high ($\gamma = 24.53$, SE=3.00, $p = .004$) than when avoidance was low ($b = 8.65$, SE=4.18, $p = .04$; see Figure 7).
Figure 7  Simple slopes showing the conditional association between overgeneralization and 1 year follow-up externalizing behaviors at high (1 SD above the mean) and low (1 SD below the mean) levels of avoidance. Overgeneralization and avoidance are grand-centered so that a score of zero represents the average level of each variable across all 81 youth. $\gamma =$ unstandardized coefficient representing the simple slope of children with high and low levels of avoidance. * $p < .05$, ** $p \leq .01$. 

HLM 2-Way Interaction Plot
Slope of change over treatment. Neither overgeneralization, avoidance, nor their interaction emerged as significant predictors of change in externalizing behaviors across treatment.

Slope of change over follow-up. Similar to the treatment outcome findings, overgeneralization predicted greater increases in externalizing symptoms over the follow-up period, although the overgeneralization*avoidance interaction did not significantly predict change in externalizing symptoms.

PTSD symptoms.

Neither overgeneralization, avoidance, nor their interaction predicted PTSD symptoms over the course of treatment, although there was a trend toward overgeneralization as a predictor of higher PTSD scores at posttreatment and the overgeneralization*avoidance interaction as a predictor of posttreatment PTSD symptoms.
Chapter 4

DISCUSSION

The current study examined overgeneralization as an inhibitor of change over the course of Trauma-Focused Cognitive Behavioral Therapy in a sample of underserved youth. More overgeneralization during the trauma narrative phase of treatment predicted a significant increase in externalizing behaviors over the follow-up period. However, more accommodation, or new learning, might help to override or regulate these global, overgeneralized cognitions, as suggested by the significant interaction between overgeneralization and accommodation. Similar to adult treatment research demonstrating the benefits of accommodation on symptom improvement (e.g., Sobel et al., 2009), accommodated beliefs directly predicted fewer posttreatment internalizing symptoms. Further, when accommodation was high during the trauma narrative sessions, overgeneralization was not associated with posttreatment internalizing symptoms, whereas the negative effects of overgeneralization on treatment progress became more apparent as accommodation decreased. The significant interaction between avoidance and overgeneralization suggests that avoidance might exacerbate these global, overgeneral cognitions and thereby inhibit posttreatment improvements in internalizing symptoms.
Consistent with findings from adult PTSD (Kleim et al., 2013; Sobel et al., 2009; Zalta et al., 2013), results from the current study also highlight overgeneralized beliefs as important in the maintenance of PTSD and recovery from it. The protective influence of accommodation on internalizing and externalizing behaviors suggests that more balanced, accommodated beliefs might help to contain the spread of overgeneralization and regulate its negative effects. Similar to animal research on extinction learning (e.g., Bouton, 2000; Lissek, 2012), the current findings indicate that both old and new learning can co-occur and that the new learning associated with accommodation might inhibit reactivity to overgeneralized beliefs in PTSD.

Accommodation was most beneficial for youth with high levels of overgeneralization during the trauma narrative. For example, one participant in the study reported acting out in his foster home when he became upset, stating that he could not trust others and always needed to watch his back (as a result of previous physical abuse). Fortunately, more accommodated and balanced beliefs (“when you’re feeling bad, you should talk to someone and not let the anger build inside you” and positive beliefs about his foster mother’s love for him) were concurrently activated and contained the spread of the overgeneralization, escalation of negative behaviors, and associated negative emotions triggered by this particular event.

Conversely, avoidance was associated with less accommodation during the trauma narrative ($r = -.32, p < .05$) and seemed to worsen the association between overgeneralized beliefs and poorer treatment outcomes. Consistent with previous research, our findings suggest that the way traumatized youth relate to their
distressing, overgeneralized thoughts might be more important than the presence of those beliefs (e.g. Shenk et al., 2014). Youth who had distressing, overgeneralized beliefs but low levels of avoidance in this study had significantly lower symptom levels than highly avoidant youth with high overgeneralization. Unsurprisingly, avoidance is associated with negative appraisals of traumatic experiences (Bal, Crombez, De Bourdeaudhuij, & Van Oost, 2009) and is believed to interrupt the process of new learning and therapeutic change at cognitive (e.g., erroneously confirming overgeneralized beliefs, Abramowitz & Arch, 2014; Gillihan & Foa, 2014) and biological levels (e.g., strengthening fear circuit activation and inhibiting new learning pathways, Sripada, Garfinkel, & Liberzon, 2013). Youth with higher levels of overgeneralized beliefs may be more likely to misuse avoidance as a long-term regulation strategy to (unsuccessfully) suppress trauma-related distress and to establish maladaptive cycles that confirm these overgeneralized beliefs and maintain trauma-related symptoms.

Interestingly, high levels of avoidance were not universally harmful in this study. Rather, youth with high levels of avoidance appeared to experience slightly better treatment outcomes than youth with low avoidance, when overgeneralization levels were low. This finding is similar to the concept of “functional avoidance” and “dysfunctional avoidance” (e.g., Bonanno, Keltner, Holen, & Horowtiz, 1995; Many, Hansel, Moore, Rosenberg, & Osofsky, 2012), which has also been identified in youth (Elzy, Clark, Dollard, & Hummer, 2013). Individuals who engage in functional avoidance may fluctuate between intentional engagement and short-term
disengagement with distressing internal experiences or may temporarily engage in avoidance to promote optimal functioning in the immediate trauma aftermath. It is possible that some of the high-avoidance youth in our study may have been engaging in short-term, functional avoidance to self-titrate their engagement with traumatic thoughts and feelings throughout the trauma narrative. Another possibility consistent with treatment research is that some highly avoidant youth may have effectively worked through their avoidance, successfully engaged with distressing material, and experienced symptom change similar to less avoidant youth (e.g., Leiner, Kearns, Jackson, Astin, & Rothbaum, 2012).

In the context of treatment, engaging in the trauma narrative theoretically activates the youth’s network of negative thoughts and emotions (Cohen et al., 2006), highlighting the importance of working through dysfunctional avoidance and facilitating engagement with trauma-related distress. After the trauma narrative is completed, ideally, the therapist assists the child in processing maladaptive (e.g. overgeneralized) thoughts and developing balanced beliefs by challenging overgeneralized and maladaptive thoughts with education, contradictory evidence, and Socratic questioning. In the case of youth with high levels of overgeneralization, there are many maladaptive belief structures that can be examined during this phase of treatment. Results from the current study indicate that youth who continue to have high activation of overgeneralized beliefs can still benefit from treatment, if they develop or strengthen more balanced, accommodated beliefs that can inhibit their overgeneralized belief patterns. However, youth who have high activation of
overgeneralized beliefs and continue to avoid during the trauma narrative may experience less improvement than those who directly confront their traumatic memory and beliefs. It is important to note that neither accommodation, overgeneralization, nor avoidance during the narrative phase was significantly correlated with any measure of symptoms at pretreatment, which suggests that these variables capture more than symptom severity.

It is also interesting to note that overgeneralization was not correlated with either accommodation ($r = -.01, ns$) or avoidance ($r = .11, ns$), suggesting that these variables seem to be separate constructs rather than aspects of a single dimension of adaptive/maladaptive trauma-related reactions. The low correlation between overgeneralization and accommodation further suggests that accommodation might represent new learning sparked by therapeutic processing of the narrative. Overall, overgeneralization emerged as an inhibitor of posttreatment internalizing problems and of long-term change in externalizing behaviors over one-year follow-up, but only when accommodation was low. Overgeneralization became less problematic as accommodation increased, indicating that accommodation may inhibit overgeneralized beliefs in both the short- and long-term. Conversely, overgeneralization became more problematic for posttreatment internalizing symptoms and 1 year follow-up externalizing behaviors as avoidance increased. Overall, there appeared to be no additional benefit for the combination of low overgeneralization and high accommodation or low overgeneralization and low avoidance, suggesting that change in all variables is not required for symptom reduction. In short, decreasing
overgeneralization, decreasing avoidance, and increasing accommodation are all important treatment goals, but change in any domain can facilitate symptom reduction in youth who have high levels of overgeneralized beliefs. Further, youth who do not have strong overgeneralized beliefs may also benefit from treatment, regardless their level of accommodation or avoidance.

Implications for TF-CBT

Similar to findings in adult treatment literature, accommodation directly predicted fewer posttreatment internalizing symptoms, which includes anxiety, depression, general emotion distress, and somatic symptoms that often co-occur with PTSD (Simon et al., 2010; Sobel et al., 2009). These findings are also consistent with previous research on TF-CBT that identified the trauma narrative as an important facilitator of change for generalized anxiety symptoms and trauma-related distress (Deblinger et al., 2011) and provide further evidence that the trauma narrative is an important treatment component for reducing internal emotional distress.

This is the first study to our knowledge that has identified a relationship between the trauma narrative and long-term changes in externalizing behavior. Previous studies have identified the caregiver-directed ‘parenting skills’ component as particularly important for successful behavioral changes (e.g. Deblinger et al., 1999), and a dismantling study found greater improvement in externalizing behaviors when the exposure-based trauma narrative component was replaced with additional
parenting skills training (Deblinger et al., 2011). Our findings, however, identified overgeneralization, accommodation, and avoidance during the trauma narrative phase as important predictors of internalizing symptoms at post-treatment and identified overgeneralization and accommodation as important predictors of long-term change in externalizing behaviors following TF-CBT. Although there was an overall increase in externalizing symptoms over the follow-up period in the current study, results identified overgeneralization as one factor that might interfere with the maintenance of treatment gains in externalizing behaviors. Together, findings from the previous dismantling literature and current study suggest that both parenting skills and the trauma narration and processing phase, in which overgeneralized beliefs are challenged and accommodated beliefs are elicited, might be important for long-term reductions in externalizing behavior following TF-CBT.

Contrary to study hypotheses and previous research with adult PTSD treatment, overgeneralization, accommodation, and avoidance were not associated with significant symptom change in PTSD-specific symptoms, although there was a consistent trend toward overgeneralization as a predictor of these symptoms at posttreatment. The lack of significant findings with PTSD symptoms may, in part, be attributed to our sample, which depended upon youth self-report and self-disclosure to measure PTSD symptoms. This is different than previous research, such as the Deblinger et al. (2011) dismantling study, which used a structured diagnostic interview that combined parent- and child-report to measure PTSD symptoms. Parent-report may be particularly beneficial for accurate measurement of youth PTSD,
especially given that high avoidance is characteristic of this disorder and may bias youth-report. With the shift to The Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5; American Psychiatric Association, 2013), the diagnosis of PTSD has expanded to include broader alterations in cognition and mood following a traumatic experience, such as anger, guilt, and shame. These diagnostic changes indicate that broad-band symptom measures, as compared to symptom-specific measures, may be particularly useful for accurately capturing the comprehensive range of trauma-related psychological sequelae, particularly in youth (e.g., Becker et al., 2011).

Limitations and Future Directions

The pattern of findings for internalizing and externalizing symptoms was generally consistent for endpoint and slope analyses, although a few of the significant interaction effects did not hold when examining the slopes over treatment and follow-up. It is possible that overgeneralization, accommodation, and avoidance may be better predictors of youth endpoint outcomes than of the slope of the change. Alternatively, it is possible that some youth may have demonstrated non-linear change trajectories within the treatment or follow-up periods, which might have minimized associations between the predictor variables and the linear slopes analyzed in the current study.
It is important to note that the current study utilized a longitudinal, within-subjects design to examine symptom change over the course of TF-CBT and did not include a control group. Although the temporal order of variables allows for some causal inference (e.g., cognitive processes measured during treatment predicted subsequent symptoms at post-treatment and 1 year follow-up), it is possible that the observed associations between overgeneralization, accommodation, avoidance, and symptom reduction could also occur naturally outside the context of treatment and could possibly have been influenced by non-treatment related factors. Future research examining overgeneralization, accommodation, and avoidance across TF-CBT and control groups in a randomized control trial could address these concerns.

This study was unique in its use of an observational coding measure to assess overgeneralization, new learning, and avoidance as they unfold during treatment. Previous literature has relied heavily on between-session self-report measures, such as the Post-Traumatic Cognitions Inventory, to measure overgeneralization. Although self-report measures can be biased by client characteristics (e.g., self-awareness and reporter honesty), self-report also draws upon the client’s comprehensive knowledge of his or her own beliefs. It is possible that self-report measures may assess a different concept (awareness of beliefs) than the CHANGE coding measure (verbal expression of beliefs). Future research utilizing a multi-method assessment of overgeneralization, new learning, and avoidance could clarify their relationships with treatment outcomes.

Finally, the current findings represent an initial examination of cognitive overgeneralization in PTSD. According to cognitive processing (e.g., Resick &
Schnicke, 1993; Sobel et al., 2009) and emotional processing (e.g., Foa et al., 2006) theories, overgeneralization represents one component in a larger network of symptomatology, including cognitive, behavioral (e.g., avoidance), somatic, and emotional experiences. Future research should examine overgeneralization as part of a larger symptom network, including how this network changes over the course of treatment and is related with treatment outcome. In addition, Deblinger and colleagues (2011) have highlighted parenting skills as another key component of TF-CBT thought to reduce externalizing symptoms, and it would be interesting to examine the combination of parenting skills and child cognitive changes as predictors of child functioning. Similarly, the current study focused on youth who experienced the trauma narrative component of treatment. Although the trauma narrative component most directly targets and activates trauma-related emotions and beliefs, it would be interesting to investigate whether overgeneralization, accommodation, and avoidance during other phases of treatment are active predictors of outcome, particularly for youth who attrite before the trauma narrative phase. Given that this effectiveness study is one of the first TF-CBT studies to be conducted with community therapists, future research might also examine therapist uptake of knowledge and skills to ensure optimal long-term outcomes, particularly with respect to externalizing behavior problems.
Conclusions

Overgeneralization, accommodation, and avoidance during the narrative exposure phase of TF-CBT were important predictors of treatment outcome over the course of this effectiveness trial, which was delivered by clinicians in community settings to a diverse sample of underserved youth. The findings suggest that: 1) overgeneralized beliefs are associated with less symptom improvement and maintenance of treatment gains 2) balanced, accommodated beliefs can serve as a protective factor, and that 3) avoidance can further intensify the effects of overgeneralization. This study adds to the growing literature that identifies overgeneralization (e.g. Moore & Zoellner, 2007), cognitive change (e.g. Kleim et al., 2013; Sobel et al., 2009, & Zalta et al., 2013), and avoidance (e.g. Shenk et al., 2014) as therapeutically-relevant processes in the development and treatment of PTSD across childhood, adolescence, and adulthood. Furthermore, the results of this study identify overgeneralization, accommodation, and avoidance as important change processes in the implementation of TF-CBT, even when delivered in community settings. These results have broader implications for the dissemination of TF-CBT and trauma-related treatments (e.g., Chorpita & Nakamura, 2004), indicating that the trauma narrative phase, particularly efforts to decrease cognitive overgeneralization and dysfunctional avoidance and to facilitate a shift towards more balanced accommodated beliefs, can be a productive focus of training, dissemination, and
implementation. Future research should continue to examine active treatment processes that can further enhance the transportability of TF-CBT across diverse patient populations and clinical settings.
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Appendix

ANALYTICAL METHOD TO ADDRESS MISSING DATA

Analyses were conducted with the 81 youth who completed at least one session from the narrative phase of treatment. Due to funding at the close of the study, the 9 and 12 month follow-up was discontinued for the final 25 youth who were enrolled into the study. All HLM analyses used the full intent-to-treat sample of 81 youth and were conducted using Full Maximum Likelihood (FIML) to account for the missing 9- and 12-month data (e.g., Arbuckle, 1996). Although the data are not technically Missing at Random (MAR), a series of logistic regressions were conducted to examine whether youth with and without 9- and 12-month follow-up differed on the outcome variables and relevant demographics variables. Results indicated that there were no significant differences between youth with and without follow-up data on pre-treatment symptoms, post-treatment symptoms, and demographics variables. Therefore, we conducted analyses on the full sample. It is also important to note that analyses conducted with only youth who received 9- and 12-month follow-up assessments showed the same pattern of results as the full sample.