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The role of positive and negative posttraumatic cognitive processing in predicting the effects of trauma. Qualitative and quantitative analysis of the narratives of trauma survivors.

PhD Thesis

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ABSTRACT

The primary objective of this research is to explore the impact of two types of cognitive processing of trauma – positive and negative – on the development of posttraumatic stress disorder (PTSD), posttraumatic depreciation (PTD) and posttraumatic growth (PTG). Cognitive processing is the process of integrating information about an experienced event with existing, previously shaped cognitive patterns. In this project, cognitive processing is divided into two types: positive and negative. Negative cognitive processing of trauma (NCPT) is connected with the following cognitive coping strategies: catastrophizing, self-blame, blaming others, rumination or focus on thought. The following cognitive coping strategies are associated with positive cognitive processing of trauma (PCPT): acceptance, refocus on planning, positive refocusing, positive reappraisal, putting into perspective.Existing literature rarely investigates the simultaneous development of trauma-related disorders following traumatic stress, along with negative and positive alterations in fundamental self and worldviews. In this study, PTSD is not regarded as an opposing outcome of the adaptation process to PTG but as one potential area of change that does not preclude the concurrent emergence of PTG. Furthermore, recent studies suggest that PTG coexists with PTD.

Research consists of two studies. The aim of the first one was to recognize specific type of cognitive processing of trauma and consequences after the first few months from the traumatic event. First study had longitudinal design with two measurements separated by 6-8 months. During the first measurement, participants (N=63) recounted their traumatic experiences, while the second one focused on evaluating posttraumatic readaptation, involving PTSD, PTG, and PTD. Quantitative analysis of interview's content involved a novel method for counting words' meanings within narratives, predicting PTSD, PTG, and PTD using natural language processing

(NLP) tools. Additionally, qualitative analysis was conducted by raters to identify cognitive emotion regulation strategies in the narratives.

The second study employed a cross-sectional design, aiming to determine the relationship between posttraumatic cognitive processing and PTSD symptom severity. Participants described their traumatic experiences, and their PTSD symptoms were assessed using the SCID-I. An additional objective of this study was to verify the agreement between the algorithm and raters.

These findings highlight the need for dividing cognitive processing to two separate ones that predict different posttraumatic readaptations. Positive cognitive processing of trauma (PCPTnegatively predicts PTSD and positively predicts PTG, whereas negative cognitive processing of trauma predicts both PTSD and PTD. Qualitative narrative's analysis confirmed that NCPT does not appear alone in the content of the story, but PCPT is also present. Furthermore, the type of posttraumatic cognitive processing can be identified during interviews with trauma survivors.

Quantitative narrative analysis with four newly created word meaning categories was conducted, but only exaggeration predicted PTSD. Moreover, the algorithm verification revealed that human raters are more accurate in recognizing word meanings within narratives, underscoring the need to avoid depending only on algorithms. Instead, algorithms should be regarded as supplementary tools in the analysis process. Limitations and future directions are considered.

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PART I

INTRODUCTION

Chapter 1 Definition of Trauma and Prevalence of Trauma In Society

1.1 Definition of Trauma

Trauma is a term overused in a colloquial sense, but there is no agreement on its scientific definition. Zawadzki and Strelau (2008) defined trauma as “a real threat to health and life external factor (natural or personal), often leading to deep and long-lasting changes in human functioning, which are expressed in the somatic and psychological way" (p.1). Wheaton and Montazer (2010) highlight a few most significant elements of trauma. According to these authors, trauma results from a single event or a long-lasting problem that is more severe than an average life-change experience and is more likely to cause long-term consequences than other stressful events.

Both definitions mentioned above emphasize the importance of the traumatic event for the development of trauma. However, a traumatic event has been defined in various ways over the last few decades. Some definitions focus on the event’s characteristics, whereas others on the experience’s aftermaths. Boudoukha et al. (2017) suggested that a traumatic event should be characterized by a sudden, brutal, and unusual threat to life or physical integrity. These authors mentioned four categories of traumatic experience: disasters (natural and caused by a human being), interpersonal violence (military operations, physical or sexual abuse), serious accident, and the sudden death of a family member or a close friend. Norris (1990) defined traumatic events as ones involving violent encounters with nature, technology, or another human being. The nature of that violence has its root in three factors: (a) the impact of unexpected and extreme

force, (b) the appearance of the outside agents, and (c) the accompanying possible feeling of fear or aversion.

The best established definitions of traumatic events are those provided by mental health classification systems, such as DSM or ICD. In DSM-III-R, a traumatic event is generally outside the range of usual human experience (American Psychiatric Association, 1987, p. 236). The stressor causing this event is not a common experience accompanying human life, such as chronic illness or business losses. In such a view, an example of a traumatic event is natural disasters, disasters caused by human beings (accidental or deliberate). In DSM-IV, the definition of traumatic stressor changed and embraced not only "direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity" but also "witnessing an event that involves death, injury, or a threat to the physical integrity of another person" and "learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associates" (American Psychiatric Association, 1994, p. 424). Direct events that match this definition are: military combat, violent personal assault, i.e. physical or sexual attack or criminal activities that lead to loss of property or physical integrity; being a prisoner of war or concentration camp; disasters caused by nature or human; severe car accidents or receiving a life-threatening diagnose. A witnessed event includes someone's injury or unnatural death caused by violent assault, wartime, or a natural disaster as well as noticing a corps or remains of body fragments. People can also learn about traumatic events concerning their close friends or family members. DSM-V (2013) mentioned not only categories of traumatic experience but also specifies particular events for a physical assault (physical attack, robbery, or mugging); actual sexual violence (forced sexual penetration, alcohol/drug-facilitated sexual penetration, abusive sexual contact, noncontact sexual abuse,

sexual trafficking) as well as other traumatic events mentioned in the previous version of DSM. It is worth noting that a life-threatening illness or debilitating medical condition are not recognized as a traumatic event. Although, if something unexpected happens during a medical procedure, i.e. anaphylactic shock or waking during surgery it can be qualified as a traumatic event. As it is in the previous version of DSM, person can also be a witness of a particular event in a direct way by observing a traumatic event. There is also a possibility of indirect exposure through finding out about an event. This is, however, limited to people with whom we have close relationships, such as friends or family members (American Psychiatric Association, 2013).

In ICD-10, a traumatic event has been defined as an extremely catastrophic or threatening experience causing the deeply felt suffering of almost everyone, such as natural disasters or caused by human beings, wars, serious injury, or being present at the moment of someone's sudden death or torture, acts of terrorism, rape or other crime (World Health Organization, 2004). In ICD-11, a traumatic event is described as an "extremely threatening or horrific event or series of events" (World Health Organization, 2019).

Terr (1991) distinguished two types of traumatic events that cause trauma: the first type of trauma is a result of a single event like rape or an assault, whereas the second type of trauma is a result of "repeated exposure to extreme external events." Solomon and Heide (1999) added the third type of trauma, caused by the longitudinal traumatic event that begins in the early age and lasts for a long period. The example of it, can be a long-lasting, cruel child abasement by relatives.

Another definition of trauma stemmed from Janoff-Bulman (1992), who proposed that an event should be classified as traumatic when it shatters our fundamental (basic) assumptions about ourselves and our world. Tedeschi and Calhoun (1995) have utilized Janoff-Bulman's

definition of trauma in their theory of posttraumatic growth (PTG) that described positive psychological changes that can occur in the aftermath of a traumatic event. Additional information about this phenomenon will be provided in Chapter 2

Although the above mentioned definitions focus on different aspects of a traumatic event, there are a few elements that they all have in common: the extraordinary nature and a feeling of excruciating psychological suffering after the event. Despite those characteristics, traumatic events are an inevitable part of life.

1.2 Prevalence in Society

A traumatic event can be experienced by any human being during everyday circumstances, and the prevalence in society is expected to be relatively high. Most studies clearly show that traumatic events are common, but their number differs due to nationality or gender. Vrana and Lauterbach (1994) examined students in Indiana. Eighty-four percent of them experienced at least one traumatic event in their life. It is worth highlighting the fact that males noted a significantly higher number of traumatic events than females. The most frequently reported traumatic events were the death of someone close, followed by an accident, a natural disaster or an explosion, sexual trauma, or witnessing an assault and a violent crime. Studies by Breslau and colleagues (1991) found that 70% of American students (M = 26 years) experienced at least one traumatic event in their life. The most frequent was an unexpected accident with severe consequences of a physical assault, witnessing injury and death of someone close, natural disaster, and rape. Hepp and coworkers (2006) examined Swiss citizens (N = 4575) for the potentially traumatic event and found that 28% had experienced it and there was no difference between genders. While women reported 2.8 times more cases of assaultive violence than men, men reported higher frequency of life-threatening illnesses and a greater number of deaths within

their circle of close family and friends. Norris (1992) in her research investigated American citizens and found that 60% of adults experienced at least one traumatic event in their lifetime, and 21% in the last year. These results show that traumatic event is a common phenomenon in society.

A traumatic event is often seen as negative, but its effects can be different in terms of the impact on various aspects of life, as well as various aftermaths of the trauma. A long-term reaction to trauma includes rapid mood changes, aggression, impulsiveness, isolation from other people, or loss of contact with reality (Dudek, 2003), which may lead to many disorders, such as depression, dissociative and conversion disorders, anxiety, and mood disorders, borderline personality disorder, acute stress reaction, acute stress disorder, posttraumatic stress disorder and complex posttraumatic stress disorder (Popiel & Pragłowska, 2008) or posttraumatic depreciation (PTD). On the other hand, individuals may experience a development called posttraumatic growth (PTG).

Following chapters address the three long-term consequences of experiencing traumatic events: posttraumatic stress disorder (PTSD), posttraumatic growth (PTG), and posttraumatic depreciation (PTD).

Chapter 2 Long-term Consequences of Trauma: Posttraumatic Stress Disorder (PTSD), Posttraumatic Depreciation (PTD), Posttraumatic Growth (PTG) and Mechanisms of Their Development

2.1 Posttraumatic Stress Disorder (PTSD)

Posttraumatic stress disorder (PTSD) is one of the most severe consequence of a traumatic event. Polish studies estimate the incidence of PTSD at 10-16% in survivors of a traumatic event (Lis-Turlejska, 2002). Szumiał (2021) conducted a meta-analysis to determine

the prevalence of post-traumatic stress disorder (PTSD) in different trauma survivors. According to his finding, the rate of recurrence of posttraumatic stress disorder (PTSD) in trauma survivors ranges from 22% to 41%, indicating that a significant proportion of the population is affected by this condition. These statistics emphasize the importance of recognizing and addressing the impact of trauma on individuals and communities.

As reported by the American Psychiatric Association (2013) to diagnose PTSD, the following symptoms lasting more than one month have to occur and be connected directly with the event:

- presence of intrusion symptoms associated with the traumatic event(s), beginning after these traumatic event(s) occurred,
- persistent avoidance of stimuli associated with the traumatic event(s), beginning after these traumatic event(s) occurred,
- marked alterations in arousal and reactivity associated with these traumatic event(s), beginning or worsening after the traumatic event(s) occurred.

The DSM-V (American Psychiatric Association, 2013) added negative alterations in cognition as a diagnostic criterion, especifically persistent and exaggerated negative beliefs or expectations about oneself, others, or the world. Individuals may also experience persistent and distorted beliefs about the cause or consequences of traumatic events that lead to self-blame or blaming others.The symptoms must be significant enough to impair an individual's ability to function adaptively in various aspects of their life, such as social activities or work.

As a long-term consequence, PTSD has an impact on survivors' health and well-being. Multiple studies showed that suffering from PTSD may cause an increased risk of physical health problems (Pacella et al., 2013; Kimerling et al., 2002), suicide attempts (Kessler, 2000;

Hendin & Haas, 1991), alcohol and drugs abuse (Debel et al., 2014; Kofoed et al., 1993), anxiety and depression symptoms (Kessler, 2000; Mertin et al., 2001).

According to Lis-Turlejska (1998), there are three groups of factors that determine the survival of traumatic events and the management of trauma:

- previous stress events, individual characteristics, and pre-traumatic psychopathology, as well as coping strategies;
- characteristics of the traumatic experience, including the degree of threat to life and health and the degree of the impact the person had on the event;
- the characteristics of the recovery environment, i.e., support of the environment or the community that did not experience the stressor, as well as their attitude towards the event.

Zawadzki et al. (2008) pointed out the emotional reactivity as one of the factors that are related to the PTSD symptoms. According to research by Zawadzki and others (2021), people with higher levels of emotional reactivity tend to be more sensitive to stimuli and are more likely to experience negative emotions such as fear or anxiety. They may also develop unhealthy ways of coping with stress and regulating their emotions, as well as negative thought patterns. Many researches (Engelhard et al., 2003; Ogle et al., 2017; Breslau & Schultz, 2013) indicate neuroticism as a second dimension of personality that is associated with the severity of PTSD symptoms. As reported in 2018, Ogińska-Bulik stated that neuroticism is strongly related to the intrusive ruminations that are conducive to the occurrence of PTSD symptoms.

A metanalysis done by Brewin et al. (2000) showed that quality of social support is one of the strongest predictors of PTSD. There are two types of social support: positive when the victim experiences emotional and practical support, and negative when the society reacts with indifference and criticism. The research concluded that experiencing negative social support is a

stronger predictor of PTSD than a lack of positive one. This relationship is stronger for women than men (Andrews et al., 2003). It is worth highlighting the fact that social support is crucial as a healing factor after trauma rather than the prevention of PTSD symptoms (Robinaugh et al., 2011).

Other category that influences trauma's readaptation considers characteristics of the traumatic event. In their metanalysis, Ozer et al. (2003) concluded that people who perceived the traumatic event as life threatening experienced higher levels of PTSD symptoms. Norris et al. (2002) divided types of traumatic events into: natural disasters, technological disasters, and mass violence. The human-caused type of trauma is associated with the most severe consequences and can be challenging to assimilate, resulting in intrusion and avoidance symptoms. These symptoms are included as diagnostic criteria for PTSD. When considering trauma from cognitive approach, it is important to note that the indiscriminate and random characteristics of mass violence, which can cause helplessness and anxiety, are more likely to shatter basic assumptions about the self as invulnerable and the world as meaningful and fair (Janoff-Bulman, 1985), leading to significant changes in an individual's cognitive functioning, including their perception, attention, memory, and other cognitive processes.

The cognitive perspective on PTSD development higlighted the significance of cognitive processing focusing on cognitive schemas. According to Dozois (2008) schemas are the mental frameworks used by individuals for processing and interpreting information from the world. These schemas are based on an individual's attitudes, beliefs, and experiences, and may be either adaptive or maladaptive. Beck (2014) stated that cognitive schemas control the processes of attention and perception, which helps to conserve cognitive resources and allows for quicker, automatic processing of information that affects the individual.

Fedoroff et al. (2000) classified two types of cognitive beliefs (patterns) that have a significant role in maintaining PTSD symptoms via increased fear and avoidance of trauma-related stimuli. These are: (a) beliefs about the occurrence of harmful events and (b) beliefs about the meaning of someone's symptoms. The first type of belief includes assumptions that situations similar to trauma occurrence (e.g., evening stroll after being raped in the night) may cause danger. As a result, the victim will experience fear and avoid trauma-related stimuli increasing PTSD symptoms. The second type of belief concerns interpretations of arousal caused by PTSD (e.g., hand shaking or intrusive thoughts) as a danger that may have potentially harmful aftermath, such as death, rejection by others, or insanity. There is a third type of belief mentioned by Landsman (2002), which is an outcome of attaching meanings to the event and its reasons, and associated with PTSD. For example, beliefs about vulnerability or blaming oneself for the event.

The concept of cognitive schemas is connected with other processes that are essential in adapting to traumatic events and integrating them into pre-existing cognitive patterns, such as assimilation and accommodation (Joseph et al., 1997). If a traumatic event is consistent with an individual's inner beliefs, it is assimilated, and the beliefs remain unchanged. The accommodation process includes the information resulting from the traumatic event into the incompatible internal beliefs and leading to their change. This process can end in two ways: positive or negative. To understand these processes one can use a comparison of Payne (2007), which suggests imagining a dense vase. If the broken vase is glued together and looks similar to the one before the fall, it can be considered assimilation. When the pieces of the broken vase are collected and thrown away, it can be identified as negative accommodation. However, the same

pieces can be used to build a mosaic and look as attractive as before the fall, in which case one can talk about positive accommodation.

The best-known theory that highlights the contribution of cognitive patterns to dealing with trauma is Horowitz's (1976) review of stress-response syndromes. The author refered to the cognitive patterns of the individual, which are the result of life experiences, beliefs, and expectations related to the future.

Horowitz mentions 5 phases of a post-traumatic reaction:

1. The outcry phase – a direct reaction to the event.
2. The denial phase – the individual ignores a threat or loss.
3. The intrusion phase – thoughts, images, and emotions connected with a traumatic event begin to return to the individual's consciousness.
4. The overwork phase – in this phase, new schemas are created after the old ones have been revised. The internal balance is progressively restored.
5. The termination phase – is the last phase, during which the traumatic processing of the event is finalized, and the newly created schemas are fixed. (Lis-Turlejska following Horowitz, 1976)

Recovering from such a difficult event requires developing cognitive patterns that will be more resistant in case of experiencing similar difficulty in the future. This process is called cognitive processing and its purpose is to integrate information about an experienced event with the existing, previously shaped cognitive patterns. The cognitive processing of trauma is automatic and can be described as intrusive thoughts appearing uncontrollably and engaging the cognitive resources of the individual (Roley et al., 2015). Intrusions serve as an indicator of cognitive processing and are considered a typical and essential element of the adaptation process, reflecting that individuals are actively processing their experiences (Stockton, 2011). People who

intrusively ruminate, tend to focus on their inner feelings and how bad they feel. They ask themselves such questions as “Will I ever feel any better?” In case of a traumatic event, the individual still wonders why it has happened to them and if they could have prevented it. The individual is not able to control these thoughts, which do not lead to the resolution of the issue (Ehlers & Clark, 2000). The result of the act of rumination is incorrect processing of information, which is conducive to exacerbating symptoms.

To sum up, the role of cognitive processing is crucial in how individuals cope with and make sense of traumatic events. The interpretation and perception of experiences can potentially result in positive or negative changes in cognitive patterns, which are referred to as posttraumatic growth (PTG) or posttraumatic depreciation (PTD).

2.2 Posttraumatic Growth and Posttraumatic Depreciation: The Opposite Psychological Changes as a Consequence of Experiencing Trauma

In the aftermath of a traumatic event, individuals often struggle to come to terms with the experience and its impact on their lives. While the concept of posttraumatic stress disorder has received much attention in psychological research, recent studies have also focused on posttraumatic growth (PTG) and posttraumatic depreciation (PTD).

A meta-analysis of 13 studies conducted by Wu et al. (2019) including 10181 subjects reported an overall PTG prevalence of moderate-to-high PTG of 52.58%. Traumatic events such as acute illness, chronic disease, cancer, violence or sexual abuse, serious illness in children, loss of an only child, professional hazards, and natural disasters were considered in the analysis. Therefore, the PTG level reported in this study is representative of a diverse range of traumatic experiences. The results of this metanalysis higlighted the importance of considering PTG as a possible outcome of traumatic events. While the impact of trauma is often associated with

negative consequences such as PTSD, it is essential to recognize that some individuals may experience growth and positive changes in the aftermath of such events.

As claimed by Tedeschi and Calhoun (2004), giving up previous goals and basic assumption is essential to experience posttraumatic growth (PTG), which is a positive change that the individual experiences because of the struggle with a traumatic event (Tedeschi & Calhoun, 1996). According to Calhoun and Tedeschi (2013; 2003), PTG can reflect in multiple changes in the assumptions divided into three conceptual categories: (a) perceived changes in oneself (b) a changed sense of relationships with others and (c) a changed philosophy of life, which is statistically reflected in five factors: appreciation of life and changed sense of priorities, change in intimate relationships with others, sense of personal strength, recognition of new possibilities or paths for one's life, spiritual development.

The model of Tedeschi and Calhoun is a theoretical framework that explains the process of posttraumatic growth (PTG) starting with encountering complex life events that challenge someone's assumptive words and beliefs (Tedeschi et al., 2018). According to authors (Calhoun, Tedeschi, 1998), those events has seismic nature that force individuals to rebuild their basic view on life: the identity of themselves, people around them, assumption about world they're living in and their future (Janoff-Bulman, 1992) in the case of traumatic events, we have to discredit the basic beliefs (assumptions) about oneself and the world. These kinds of beliefs are usually very resistant and do not change; therefore, traumatic events can lead to shattering them. Complete recovery from trauma requires a gradual adaptation of beliefs and views to the post-traumatic reality in such a way as to ensure self-esteem and security. This process involves cognitive engagement, including making sense of the traumatic event and anticipating future challenges, indicated by deliberate ruminations that involve deliberate and conscious attempts to notice the

positive sides of an experience (Lindstrom et al., 2013). Consequently, the survivor will develop new schemas, goals, and meanings. This can result in the recognition that certain life goals and beliefs are no longer realistic. As a consequenece, individual focus on future, set new goals leading to increased life-satisaction, and rebuild basic beliefs. As a result, this deliberate processing may facilitate posttraumatic growth. Several studies (Cárdenas et al., 2019; Zhou & Wu, 2016) showed that deliberate ruminations mediate the relationship between challenges, core beliefs and PTG.

According to the model, PTG can occur even in the face of extreme adversity, as individuals may develop new perspectives and skills that enable them to grow and thrive despite the trauma they have experienced. It is essential to be highly engaged in building a new one with the same persistence. Newly created assumptions are more prone to being shattered in case of similar traumatic. One of the key outcomes of posttraumatic growth is the development of life wisdom through effective coping with the traumatic experience. Research shows that the degree of challenged core beliefs is one of the strongest predictors of PTG (Webster & Deng, 2015). However, it is important to note that not all individuals who experience trauma will experience PTG, and the process of growth can be complex and challenging. In addition, a disclosure such as revealing or sharing the traumatic event, especially in forming the narrative with a person who carefully listens to us (an expert companion), promotes PTG (Tedeschi & Calhoun, 2009). It is essential to emphasize that psychological debriefing sessions are not recommended as the intervention for acute trauma (Arancibia et al., 2022). The process of self-disclosure about a traumatic event through expressive writing is a factor that has been found to influence the occurrence of posttraumatic growth (PTG).

Pennebaker (1990;1986) proposed a model in which dealing with trauma requires disclosing emotions verbally, facilitating the assimilation of coping with the situation. It is done by organizing and giving meaning to the trauma during expressive writing session. Talking about trauma is contrary to inhibition, which causes cumulative stress in the body, making one more prone to stress-related diseases. The association between trauma disclosure and the intensity of posttraumatic growth is consistent with theoretical foundations that suggest that sharing one's experiences can facilitate the coherency of their story, promote a sense of meaning-making, and facilitate healthy emotional processing (Graybeal, 2002; Park et al., 2002), further supported by empirical evidence from studies conducted by Henderson et al. (2001) or Taku et al. (2009).

Baker and colleagues (2008) observed that not only positive changes to cognitive patterns result from a traumatic event, but trauma survivors can also experience negative changes, which paradoxically can be experienced in the same domain as in PTG. Those changes are called posttraumatic depreciation (PTD). Previous findinngs (Cann & Tedeschi, 2010; Taku et al., 2021) confirmed that these two phenomena can exist parallel in each domain: a person who experiences closer relationships with some people (e.g., mother) can experience depreciation in relationship with other people (e.g. friends).

Research by Allbaugh et al. (2016) showed that deliberate ruminations can predict PTG, whereas intrusive and deliberate ruminations can predict PTD. On the other hand, intrusive ruminations are destructive and constitute a predictor of PTSD (Ehring et al., 2008).

The various consequences outlined in this chapter all share a common factor: cognitive changes that occur as a direct result of experiencing a traumatic event. By gaining a better understanding of the psychological mechanisms involved in coping with trauma, it may be possible to predict which potential effects of trauma are more likely to occur.

Chapter 3 Cognitive Coping Strategies for Stress Management

Lazarus and Folkman (1984) defined coping as "the process of managing demands (external or internal) that are appraised as taxing or exceeding the resources of the person."(p. 283). Appraisal refers to a cognitive activity consisting of two stages: primary appraisal which aims to evaluate how the situation affects one's well-being, and secondary appraisal which focuses on assessing the extent of the actions that can be undertaken to cope with this situation. During the first appraisal, a person evaluates the event that one is experiencing. Lazarus and Folkman recognize three types of primary appraisal. The first one is irrelevant, and a person will do anything to cope with its outcome. The second one is benign-positive, which means for a person's preservation or even improvement in well-being. The third one is stress appraisal which can consist of past-related harm/loss or future-related threat or challenge. Challenge is a specific type of stress that can cause a potential gain in the future but still needs some action to fulfill the potential, for example a job promotion and exceeding efforts to master new tasks. Only the third type of primary appraisal leads to the secondary appraisal during which a person evaluates the resources that can help to cope with the stressful situation. If a person has no resources and is incapable of coping, one experiences more stress. Otherwise, one will apply various coping strategies that can be divided into two commonly used categories: emotion-focused and problem-focused (Baker & Berenbaum, 2007; Billings & Moos, 1981; Parker & Endler, 1992). The difference between them is that the aim of problem-focused is managing the problem which causes distress, whereas emotion-focused coping focuses on the regulation of the emotion associated with the stressor (Folkman, 1984, as cited in Kelso et al., 2005).

Garnefski et al. (2001) stated that all coping efforts are somehow a part of emotion regulation. Their division focused only on coping strategies connected with cognitive coping

understood as *"*a cognitive way of managing the intake of emotionally arousing information*"* (Thompson, 1991, as cited in Garnefski et al., 2001). The emphasis is placed on strategies connected with a cognitive dimension and preceding any action undertaken to solve the problem. Garnefski divided these strategies into two types: (a) adaptive strategies that consist of positive refocusing, positive reappraisal, putting into perspective, refocusing on planning and acceptance and (b) less adaptive strategies containing rumination, self-blame, blaming others, and catastrophizing.

I will now discuss each of the strategies along with the results of empirical studies that verified the mentioned division, starting with non adaptative ones. The first non-adaptative strategy in Garnefski's model (2009) is self-blame, this involves attributing responsibility for events in which a person was involved to themselves. This may manifest in pointing out actions that the person did during the event or those that he or she might have chosen to do or avoid in order not to lead to the traumatic event, e.g., "If I had asked her to buckle up, then my mother might still be alive." Research shows that this strategy is positively correlated with depression and anxiety (Martin et al., 2005; Kraaij et al., 2007) as well as intrusion and avoidance subscales of PTSD (Kraaij et al., 2007). The second strategy is blaming others in which we put the blame on others for what happened. The trauma survivor focuses on assigning blame for the event to others, looking for reasons for the event in actions that were missed or performed, e.g., "I broke my leg because she wanted me to mop the floor right then." In the research, it is positively correlated with depression (Martin et al., 2005) and overall PTSD symptoms (Puechlong et al., 2021), and the subscale of PTSD symptoms: intrusive thoughts, avoidance, negative cognition, and arousal (Kaczkurin et al., 2017).

The next non-adaptive strategy is rumination, in which a person is constantly thinking about an event and reliving the emotions that are connected with this event. Thoughts may appear suddenly, the person constantly analyzes the whole event, its causes and consequences, e.g., "You know, I keep thinking about what would have happened if I had decided to call an ambulance earlier." Research (Martin et al., 2005 & Kraaij et al., 2007) showed that there is a positive association between rumination strategy and depression and anxiety. It positively correlates with overall PTSD symptoms (Jennes et al., 2016; Puechlong, 2021; Jenness et al., 2016) as well as the intrusion subscale (Kraaji et al, 2007), the avoidance subscale (Kraaji et al, 2007; Liu et al., 2019) and both the negative cognitions and arousal subscale (Liu et al., 2019). The last non-adaptive strategy is catastrophizing in which a person focuses on the horror of the event and emphasizes its extremely traumatic nature. The person focuses more on the qualitative features of the event than on the facts. The description is characterized by a certain amount of drama and even exaggeration, e.g., "Nothing worse could have happened. I did not know it was possible to suffer so much". There is a positive correlation between catastrophizing, depression, and anxiety (Martin et al., 2005; Kraaij et al., 2007) along with PTSD symptoms (Jennes et al.,2016; Puechlong, 2021) and the intrusion subscale (Kraaji et al., 2007; Liu et al., 2019; Kaczkurin et al., 2017) as well as avoidance, negative cognition, and arousal (Kaczkurin et al., 2017). Garnefski et al. (2009) in their research concluded that rumination and catastrophizing were related to the internalizing problem.

The first adaptive strategy is acceptance which involves accepting the event and its negative consequences. The person emphasizes that he/she is reconciled with the situation and can face what the future will bring, e.g., "I accepted the loss of my wife a long time ago. I have decided to build a life anew". Research shows a weak positive association between acceptance

and depression (Martin et al., 2005). Another strategy is refocus on planning, in which a person plans next steps that need to be taken to minimize the effect of a negative event. The individual focuses on what they can do to improve the situation, e.g., “Right now, I’m focusing on getting my fitness back, at the same time I’d like to get a part-time job.” The results of the research showed a positive association between refocusing on planning and depression, anxiety symptoms as well as the intrusion and avoidance subscale (Kraaij et al., 2007). Another adaptive strategy is positive refocusing entails focusing on positive thinking and things and events that evoke positive emotions. A person who has experienced a difficult event looks for ways to experience good emotions, e.g., “Every day before I get down to rehab, I brew myself a cup of coffee. The smell of it makes me revive memories of my youth.” There is a negative correlation between positive refocusing and depression (Martin et al., 2005) but there is no significant association between positive refocusing and anxiety. There is a negative association between this strategy and the subscale of intrusive thoughts and negative cognitions (Kaczkurin et al., 2017). Positive reappraisal is another strategy that focuses on finding positive values in the event for the person and their personal growth. The person views his/her traumatic experience as a catalyst for positive change, e.g., “I used to not appreciate moments with my family. Since the accident, every hour I spend with them is a true treasure”. Both anxiety and depression are negatively associated with positive reappraisal (Martin et al., 2005) as well as the intrusion and avoidance subscale of PTSD symptoms (Liu et al., 2019). The last adaptive strategy is putting into perspective by placing the event in a broader context, which has the effect of lowering the seriousness of the event. The person downplays their own trauma by comparing it to other, more serious events, e.g., “Amputating a finger is not a tragedy. They could have amputated my whole

leg, then it would have been worse". Research shows that there is a negative correlation between this strategy and both anxiety and depression (Kraaij, 2007).

These findings indicated that that some cognitive emotion regulation strategies are more associated with a higher level of PTSD symptoms (refocus on planning, catastrophizing, other blame and self-blame, rumination) others with a lower level (positive refocusing or positive reappraisal). Depression and anxiety symptoms are positively connected with self-blame, blaming others, rumination, and catastrophizing, whereas they are negatively correlated with positive reappraisal, putting them into perspective. Additionally, depressive symptoms were positively related to positive refocusing. These results partially confirm the classification of Garnefski and allow us to divide cognitive emotion regulation strategies into non-adaptive in relation to symptoms of depression anxiety and PTSD (refocusing on planning, catastrophizing, other blame, self-blame, rumination) and other as adaptive (acceptance, positive refocusing, positive reappraisal, putting into perspective).

I proposed assigning each strategy as an indicator of different types of cognitive processing, resulting in various types of trauma aftermath. Negative cognitive processing of trauma refers to the way individuals think about and interpret their experiences of trauma. This can include cognitive strategies such as catastrophizing, self-blame, blaming others, and rumination may lead to maladaptive trauma adaptation, including the development of PTSD and PTD. The second category of cognitive processing of trauma is characterized by positive strategies that individuals can use to regulate their emotions. These strategies include acceptance, refocusing on planning, positive refocusing, positive reappraisal, and putting into perspective. By assigning coping strategies as indicators of different cognitive processing styles, we can gain a better understanding of how individuals may respond to trauma.

Chapter 4 The Method of Quantitative Narrative Analysis

The process of traumatic readaptation is significantly influenced by the cognitive processing and formation of cognitive representations in the form of narratives. Specifically, the process of constructing a narrative that incorporates the traumatic event into the individual's life story can help to create a sense of coherence and meaning (Baerger et al., 1999; Tuval et al., 2004). As a result, through the analysis of narratives, we can predict the form of traumatic readaptation that an individual may adopt.

The initial stage of analyzing text or discourse involves identifying the particular characteristics that classify it as a narrative. These features include the description of a coherent, causal account of past or future events, as well as the presence of a specific shape, structure, and plot in the sequence of events. The plot is a key characteristic that influences interpretation as well as giving meaning to the events (Murray, 2003). There are different types of narrative analysis that deal with the topics of the narrative in the content of the story (thematic analysis), its structure (structural analysis), interpretations that are given (hermeneutic analysis), or how the language is used in the social context (discourse analysis) (Riessman, 2008; Howitt & Cramer, 2010).

Content analysis understood as “systematic reading of a body of texts, images, and symbolic matter, not necessary from an author’s or user’s perspective” (Krippendorff, 2018, p. 10) originated in the quantitative analysis of newspapers at the end of the 19th century, laying the foundation for the long history of journalism research. In psychology this method has been applied in four areas: (1) analysis of the written content from material and personal documents (2) verbal recording of open interview questions, focus group conversations and other voice responses in tests (3) communication processes between humans (4) drawing conclusions about

the meaning that individuals ascribe to different cultural situations by analyzing the content of the individual's opinion (Krippendorff, 2018).

The content analysis can be performed in two ways: qualitatively and quantitatively. Both can be carried out for the same text fragments. Qualitative analysis is focused on understanding certain phenomena by getting into depth, thinking about the type of data, how to describe and explain it. While doing this kind of analysis, the researcher describes what happened in the content to show the whole variety of the event and highlight the connections between what happened, human intentions and action strategies (Gibbs, 2011). Another approach to analyzing the content (the quantitative one) is focusing on transforming interviews so that statistical analysis can be done. This method is much more codified and enables the researcher to extract the frequency of the coded unit - themes, categories, or words. The idea behind the word counting is that the more often a word is used the more important it is to the person (Carley, 1993). Within this context, the processing of a story involves the extraction of word frequencies and their association with particular psychological categories. The content of the narrative is treated as a bag of words that should be sorted out and counted in terms of the frequency of words appearing in the content. Using the method as a source of information about the person is time consuming. Researcher has to count each word that belongs to the linguistic categories (i.e., word “love” to category “emotion”) or the grammatical one (“love” as a noun or verb) (Szymczyk et al., 2012). Technological development has enabled to transfer word counting from a human to a computer program. To use the software in the analysis, the only requirement is that the category being researched must be included in the list of available provided options.

Linguistic Inquiry and Word Count (LIWC) is one of the most used software tools in psychology for the analysis of word frequency. LIWC has two basic functionalities: text

processing and built-in dictionaries (Pennebaker et al., 2001). During text processing a bunch of text files is reduced to single words along with the frequency of their occurrences in the predefined categories. There are two types of categories: (a) linguistic which contains grammatical categories such as pronouns, articles, verbs, etc., and (b) psychological, which contains information about psychological processes or emotionality of words. The result of multiple research shows that based on content analysis, we can draw conclusions about the psychological properties of people. For instance, experiencing physical or emotional pain relates to using of first-person pronouns (Rude, Gortner & Pennebaker, 2004), whereas third-person pronouns are significant predictors of deception (Bond & Lee, 2005). Using LIWC as the method is beneficial for identifying how the individual constructs narratives, how she/he chooses vocabulary and if there are any distinguishable linguistic patterns. The researcher should remember that this method is dedicated to the content analysis and will not support analysis of the formal narrative structures (Silverman, 2011).

An important limitation of the simple dictionary-based word counting is that it may lead to a word's incorrect (double) assignment to a particular category. This may be due to errors made during the transcription of the text. For example, if someone makes a typo and writes „bee" instead of „be" the final count of words in two categories will be different. Incorrect assignment to a category can also occur by omitting the context in which a word is used. For instance, the word „close" can be recognized as an adjective and level of approximation, whether related to physical distance or emotional or as a verb of physical activity related to closing the door. This is closely connected with the challenge that simple software does not recognize the word's meaning. According to Słowosieć that is the source of words (and their meanings) for computer-based language processing and research on artificial intelligence (AI) (Maziarz et al. 2014) the

word “cancer” has ten meanings, e.g., a disease or an animal or a sign of the zodiac. Choosing of a specific meaning influences the final statistics in the categories leading to measurement errors (Hirsh & Peterson, 2009).

So far, there is no method that supports creating dictionaries containing words’ meaning, not only words that meet the definitions of the specified psychological categories. In order to fill this gap, next chapter will introduce an innovative method for creating words’ meanings categories.

Chapter 5 Author's Method of Creating Categories of Words’ Meanings

The new method of counting meanings of the words was needed to achieve the research goal and eliminate the weaknesses of existing frequency analysis methods. Categories that include not words but particular meanings demand a source which captures all words with their meaning. plWordNet addresses this need as the most extensive lexico-semantic network in which nodes are meanings of word. As an example, all meanings of the word “*think*” are presented in the Table 1.

Table 1

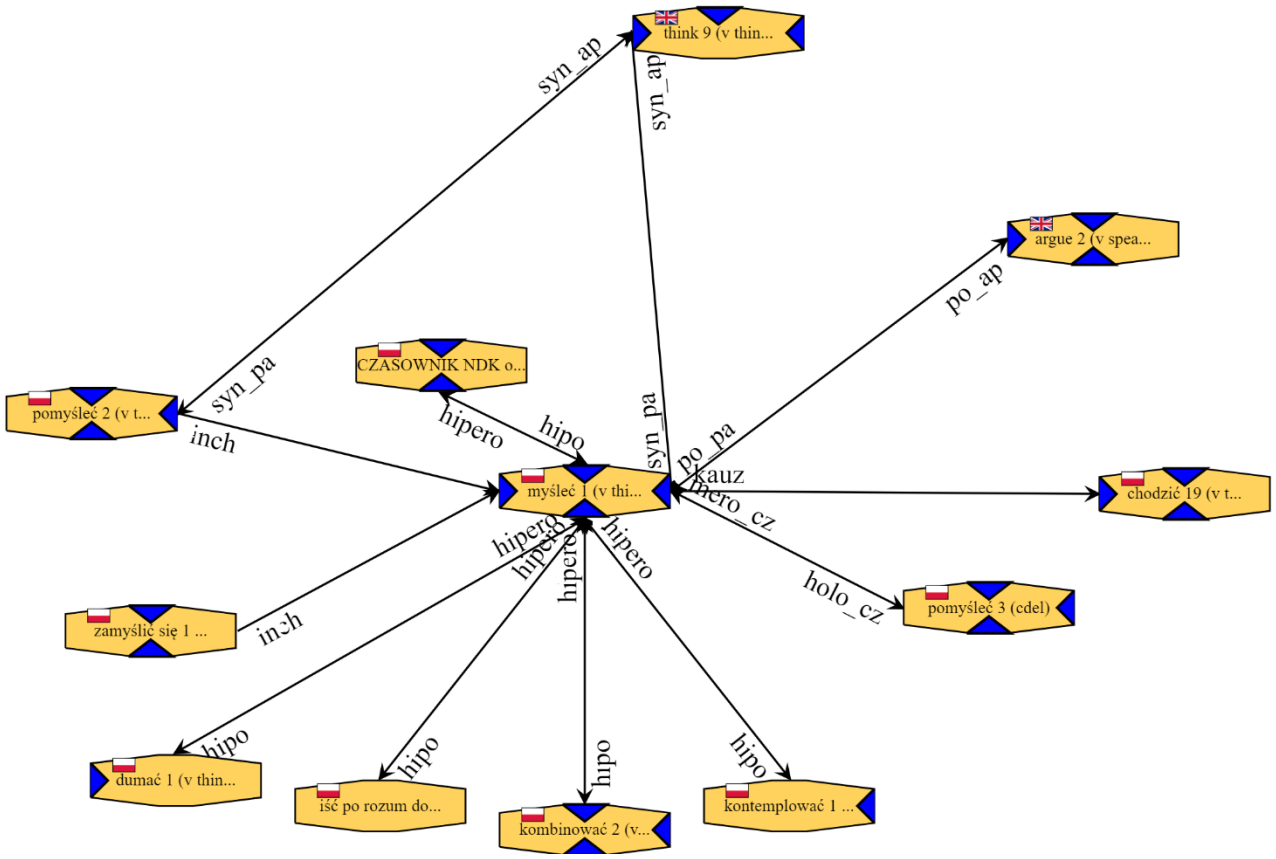
All meanings of word think.

Word	No	Meaning
think	1	carry out the thought process, engage in the activity of the mind
	2	have someone or something constantly in mind, to have in mind
	3	believe, think, have the opinion
	4	judge something or someone, have an attitude towards someone or something
	5	intend something, design, consider taking action

For each word, AI algorithms are applied to search the usage examples and closelysemantically related words in the database of text (corpus). Algorithms also propose new words' meanings that can be linked to the node in plWordNet. (Maziarz, Piasecki, & Rudnicka, 2014), as in Graph 1.

Graph 1

Graphical visualization of all meanings of "think" in Słowosieć



Note. The graph demonstrates the available graphical representation for the Polish Wordnet, where the central word's meaning serves as a unit from which other meanings of the word derive. Hiper- hyperonym; Hipo – hyponym; Inch - inchoative verbs; Syn_pa – Polish-English synonyms; holo-cz – verb holonym; mero – cz – verb meronymy; po_pa - English equivalent for the Polish lexeme; kauz: causality. Data retrieved from Dziób (2019).

The development of words' meaning category aims at creating a list of meticulously chosen words` meanings and comprises seven steps. The order of the steps performed during this procedure is arranged in the funnel approach similar to the one applied in interviewing in psychology. According to this paradigm the most effective approach to conduct psychological interviews is to start with more general questions and progressively move closer to the topic of interest (Roller & Lavrakas, 2015). The proposed methodology of choosing proper words' meanings applies a similar strategy. The result of each further step in the process is the narrowing of meanings that will be subjected to final evaluation by the raters. The proposed method increases the overall efficiency of the process by saving time of raters.

Using words' meaning categories in frequency analysis have a few advantages over standard words' counting. First of all, meanings are more accurate than single words to indicate phenomena that we want to capture. Secondly, invented method allows to create categories that take into account words that are rarely used. Third of all words' meaning categories are independent and can be implemented in various tools, for example using *Own category* functionality in LEM (Literary Exploration Machine) which enables to count words in particular meaning.

First step: Obtaining data

The first step in the process is acquiring relevant text related to the phenomenon we want to observe in the language. Duncan (1989) postulates that the sample that we base on should be representative of the context from which it is drawn. Creating a category containing vocabulary about the reaction to trauma requires a corpus of text that contains certain domain manifestations activated during the particular experience.

Second step: Definition of a new category

Awareness of the psychological mechanism we are looking for is essential to create an accurate language indicator. The explanation of the psychological nature of phenomena is part of the coding scheme for raters who decide whether to include code unit in the category or not. Syed and Nelson (2015) identified the need to determine what a coding scheme should include to address them effectively. There are two ways of developing a coding scheme: top-down and bottom-up (Chi,1997). In the first one, categories are defined based on the existing theory that explains which words will be qualified to the category. The bottom-up approach refers to constructing a category based on revising the material and using it to invent new hypotheses. The design of methodological procedure of creating categories containing word meanings draws from a top-down approach in which researchers define the object of interest in the text. Due to the fact that presented method is dedicated to single words, there was no need to include the stage of deciding on the unit of analysis (word, sentence, paragraph). Raters, using a coding manual as reference, are responsible for assigning the meaning of words to specific categories. The content of the coding manual should include information about codes, examples of meanings that can be included into or excluded from the specific categories (Syed & Nelson, 2015). It should be clear that raters should not look for a secondary association, if a word doesn't explicitly belong to a certain category. For instance, let us assume that the definition of a category is "Meanings indicating the attribution of blame to someone (oneself) for an event, e.g., blame, responsibility, etc..". If a rater has a high level of achievement motivation, he/she can regard the adjective "last" as a meaning that can be used in the situation of blaming someone for something, i.e. "I was last in this competition, because I do not try hard enough". Nevertheless, this word is the neutral numerator and, as such, cannot indicate the attribution of guilt to

someone. The coding manual expands with each iteration of evaluated material, which is natural at the beginning of the coding process.

Third step: Corpus preprocessing and obtaining a frequency list

The initial step towards selecting appropriate words and meanings involves preprocessing the gathered narrative. Preprocessing has a crucial role in text mining techniques, and it is the first step of the text mining process. Standard preprocessing techniques for text mining includes (a) stop words removal, (b) stemming or lemmatization and (c) words extraction (Vijayarani, Ilamathi, & Nithya, 2015). Before starting the proper process of text analysis transcription should be prepared, which includes erasing the consequences of preparing transcription according to protocol (Wardell et al.,2021), such as s reflection of punctuation, unclear audio (e.g., inaudible), ellipses (e.g., (...)), hyphens (e.g., I – well I am not sure), marking noises (e.g., sighs), identification of interviewer and interviewee in square bracket (e.g., [Researcher]). Stop words removal is the first standard technique aimed at excluding all meaningless words. Stop words are common and have no important function in the content (Pandey & Siddiqui, 2009). Usually, stop words vocabulary includes the following words: pronouns, quantifiers, and other meaningless words (Yong et al., 2009). In psychology, stop words have an important function in revealing information about psychological mechanisms and personalities. For example, a few studies have been published on the association between depression and using the pronoun "I" as a marker of self-focused attention (Rude et al., 2004; Tackman et al., 2019; Brockmeyer et al., 2015) or the importance of the filler words on the personality diagnosis (Laserna et al., 2014; Duvall et al., 2014; Ishihara et al., 2010). Therefore, removing stop words as a standard preprocessing technique will not be applied in this method. Two other techniques (stemming and lemmatization) are used to identify the stem of the word. When compared to stemming,

lemmatization is more complex as it is dependent on the successful interpretation of the morphological, syntactic and semantic properties (Maryl et al., 2018). The difference between those two techniques is visible in the following example: *"If confronted with the token saw, stemming might return just "s", whereas lemmatization would attempt to return either see or saw depending on whether the use of the token was as a verb or a noun"* (Manning et al., 2008, p.9). The third technique is extraction which is mainly based on tokenization – a process of converting a stream of text into separate units called tokens (Hassler & Fiedl, 2006), which are usually the equivalent of one word. For example, sentence: "Everything ended well, despite the doctors' poor prognosis" has 10 tokens: (1) "everything", (2) "ended", (3) "well", (4) ",", (5) "despite", (6) "the", (7) "doctors'", (8) "poor", (9) "prognosis", (10) ".".

Obtaining a word list containing the amount of each word used in the preprocessed corpus is the final goal of corpus preprocessing. This task can be achieved using Python or R libraries, such as NLTK (Bird et al, 2009) or tm package (Feinerer, 2013). In this study to accomplish this goal I use a morpho-syntactic tagger that is available in Literary Exploration Machine (LEM) which is a part of CLARIN tools and is accessible in multiple languages. CLARIN is the short name for the Common Language Resources and Technology Infrastructure. It provides easy and sustainable access for social scientists to digital language data and advanced tools to discover, explore, exploit, annotate, analyze or combine them (Krauwer, Hinrichs, 2014). LEM enables to apply lemmatization and tokenization in one step, and to obtain a frequency list of words appearing in corpora. Words that appear in the corpora more than 5 times are qualified to the next step of analysis in order to reduce the amount of units that raters will evaluate.

Fourth step: Grammatical class choice

In the fourth step, the goal of the researcher is a proper choice of grammatical class in the created category. The main purpose of this step is to do the initial limitation of words which will be evaluated by raters.

In narrative research, words may be considered as a way of expressing human reflection. This way is conventionalized and regulated by the rules of the language, such as grammatical classes to which words in a particular language belong. These classes can significantly differ from each other (Whorf, 1945). To the point where even a simple translation is possible (i.e., when the grammatical classes are completely incompatible), it is difficult to find lexicalized equivalents with the same meanings. However, in this research we focus on Indo-European languages, where the basic grammatical classes include parts of speech such as: noun, pronoun, adjective, verb, adverb, preposition, conjunction, and interjection. The simplified semantic field typical for the specific categories can be described as follows: verb - actions, states, processes, movement, change of properties; noun - things, physical objects, phenomena and abstract problems of a static nature, creations, properties of objects; adjective - features of objects, physical features, abstract features, features relating to nouns; adverb - features of processes, states, movement, typical for verbs.

The study of meaning-related aspects of texts (semantic layer) requires narrowing down the parameters to be observed (step one), and then adequately selecting the group of annotated/evaluated parts of speech (step fifth).

Fifth step: Choice of words

In the fifth step, words obtained in the third step are evaluated by the raters who decide whether they meet the definitions of the category. Raters should be educated in the field for

which the category is created. Before starting their work, raters should undergo training in acquiring and verification of both types of knowledge: declarative and procedural (Gorbaniuk, 2016) as well as familiarize with important terms/phenomena and with the explanation why words are included in the category. Words are qualified to the next step of the process that at least two raters decide that meet the criteria of the definition.

Sixth step: Choice of words' meanings

In the sixth step, the raters evaluate all the meanings of words chosen from the previous step. They should not automatically include words that have a single meaning to the category, because the definition of this meaning may indicate that finally it does not fit into the category. The final result of this step is a list of meanings meeting the criteria of the definition chosen by at least two raters.

Seventh step: Expanding the category with hyponyms, synonyms and hypernyms

In this step, the additional meanings which did not occur in our text corpus can be included in the category. Those words' meanings result from generating hyponyms, synonyms, and hypernyms from plWordnet. Downloading all words' meanings from Wordnet can be performed using web applications such as Słowosieć or MySQL script to speed up this task. The result of this action is the list of words' meanings with the definition and the type of relationship with the meaning (e.g., hyponyms, synonyms, or hypernyms). After generating additional meanings, the master rater in the person of the primary investigator, independently decides whether to include a particular meanings which did not occur in the corpus to the category. The addition of new meanings to a category in Wordnet can be accomplished independently by a primary investigator. This is because the relationships between meanings in

the database are determined by a distinct methodological process in which lexicographers determine the nature of connections between words. (Maziarz, Piasecki, Szpakowicz, 2013).

PART II

RESEARCH

Chapter 6 Research Aims and Research Concept

The aim of the present research was to distinguish negative and positive cognitive processing of trauma and their impact on readaptation after a traumatic event. Another goal was to find the linguistic predictors of trauma readaptation in narrative content through the use of an innovative method of counting words' meanings. The research was conducted in two studies.

The first study has a longitudinal design consisting of two measurements, spaced 6–8 months apart. This study was performed in a sample of adult participants that experienced a traumatic event as it is defined in the DSM-V Criteria A. The first measurement sought to diagnose the use of positive or negative cognitive processing of trauma and its consequences based on the Cognitive Emotional Regulation Questionnaire (CERQ) by Garnefski & Kraaij (2007). Another goal of the first measurement was to perform a rater-based qualitative analysis of the narratives shared about traumas during an interview in order to specify the use of word`s`meanings that were hypothesized to influence the readaptation to trauma. In the second measurement, trauma readaptation was evaluated with the Structured Clinical Interview for DSM-(SCID-I) and PTGDI-X questionnaire.

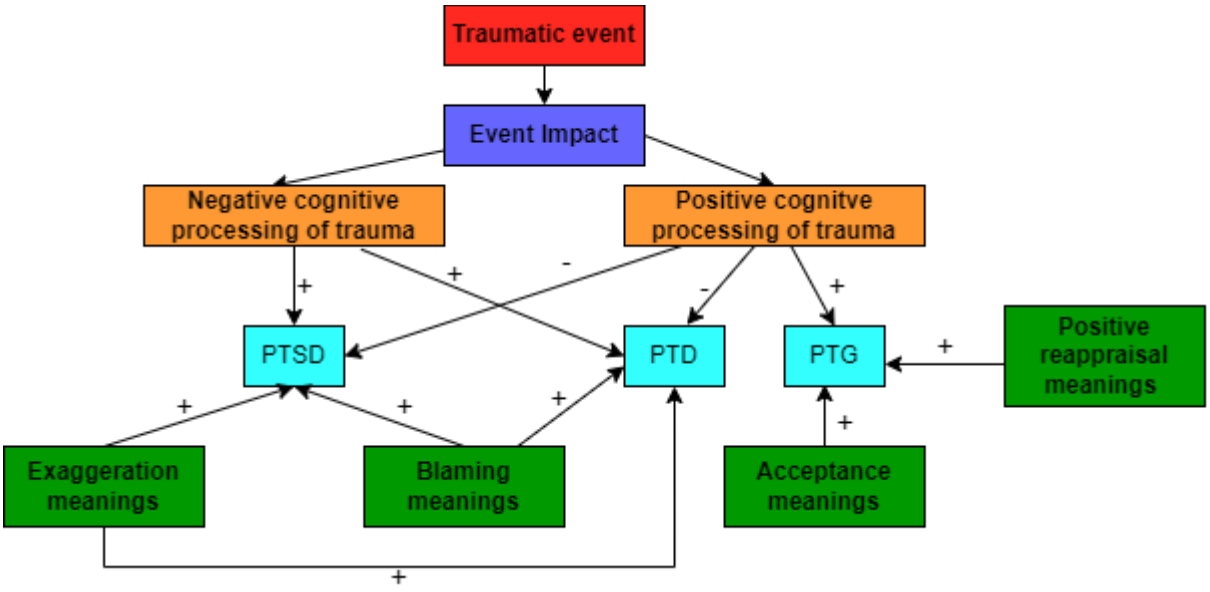
The second study was a cross-sectional one that sought to replicate the results from the first study on a sample of adult participants that had been involved in a car accident. In this study participants were interviewed about their traumatic experience, its psychological aftermath and

their coping styles; they also completed several questionnaires to evaluate their emotion regulation capabilities and were interviewed for the presence of PTSD.

The following model of the role of cognitive processing in predicting the aftermath of trauma is proposed:

Graph 2

Model describing the role of negative and positive cognitive processing in predicting trauma's aftermath:



STUDY 1

Chapter 7 Research Questions and Hypotheses

The first study was carried out in a group of trauma survivors (N = 63) in longitudinal design and consisted of two measurements. The first measurement was carried out within 1–6 months after the traumatic event and the second measurement followed 6–8 months after the first measurement. The participants described their experience of trauma during the interview.

The aim of the first study was to answer the following research questions:

1. Which type of cognitive processing of trauma is a predictor of posttraumatic stress disorder (PTSD)?
2. Which words' meanings in the narrative content predict PTSD?
3. Which type of cognitive processing of trauma is a predictor of posttraumatic depreciation (PTD)?
4. Which words' meanings in narrative content predict PTD?
5. Which type of cognitive processing of trauma is a predictor of posttraumatic growth (PTG)?
6. Which words' meanings in narrative content predict PTG?

Based on the literature review, the following hypotheses were proposed:

H1. Negative cognitive processing of trauma (NCPT) is a predictor of PTSD.

H2. Positive cognitive processing of trauma (PCPT) is a negative predictor of PTSD.

H3. Blaming words' meanings are predictors of PTSD.

H4. Exaggeration words' meanings are predictors of PTSD.

H5. Positive cognitive processing of trauma (PCPT) is a negative predictor of PTD.

H6. Negative cognitive processing of trauma (NCPT) is a predictor of PTD.

H7. Blaming words' meanings are predictors of PTD.

H8. Exaggeration words' meanings are predictors of PTD.

H9. Positive cognitive processing of trauma (PCPT) is a predictor of PTG.

H10. Positive reappraisal words' meanings are predictors of PTG.

H11. Acceptance words' meanings are predictors of PTG.

Chapter 8 Method

8.1 Participants

Participants included 49 women and 14 men aged from 18 to 57 years (M = 31.05, SD = 10.02) who experienced traumatic event as it is defined in the DSM-V Criteria A (36% was exposed to actual or threatened death, 6.3% learnt that the traumatic event(s) occurred to a close family member or close friend, 9.4% experienced physical assault, 48.4% witnessed death in person). Participants were recruited either through recruitment agency or Facebook community advertisement. To be included in the study, participants had to meet two criteria: (1) be between the ages of 18-65 and (2) have experienced an extremely stressful event that was either highly threatening or catastrophic in nature within the last one to six months. All potential participants were asked before interview what type of traumatic event they experienced and assessed whether this experience consisted of the criteria of the traumatic event.

8.2 Procedure

The study was conducted in a longitudinal scheme and consisted of two measurement. In the first measurement, participants were interviewed about their traumatic event and completed questionnaires (see chapter 9.3). The interviews were conducted on-line by the primary investigator, who is a psychologist. The interviewer did not disrupt the interviewee with any additional questions. Interviews lasted from 3 minutes to 48 minutes. After interview, interviewer was available to contact with the researcher in case one experienced emotional

upheaval. In the second measurement, participants were diagnosed by qualified psychiatrists or psychotherapists with regard to PTSD using the Structured Clinical Interview (SCID-I) module *F* (First, 2004; Polish adaptation by Popiel et al., 2010) and completed a questionaire to specify the intensity of PTG and PTD (see chapter 9.4). The time distance between first and second measurement was 6 to 8 months.

8.3 Materials and methods

8.3.1 First measurement

Interview

> In the first measurement, traumatic survivors were asked a following question: I would like to ask you to tell me about a difficult event. Please try to recall this specific event that was an extremely stressful experience for you and had extremely threatening or catastrophic nature and happened within the last 6 months. Even if this recollection is unpleasant, I would appreciate your attempt to be as detailed and as honest as you can. Please remember to describe the event in detail. What happened? When? Who was involved? What were you doing, thinking, feeling? What effect did this event have on you? What does it say about who you were or are? I will not interrupt you or ask additional questions. It is important that this is your story. It usually takes about 15 minutes.

Questionnaire for PTSD symptom severity

PTSD symptom's severity was assessed with PCL-5 (Blevins, 2015) in Polish adaptation by Rzeszutek et al. (2018), a 20-item self-report questionnaire in which each scale represents DSM-5 criteria: B-intrusions; C-avoidance; D-negative cognitions and mood alterations; E-hyperarousal and heightened reactivity. Participants declare how

much they experienced the specified symptoms using a 5-point scale (1 = *not at all* to 5 = *very strongly*).

Questionnaire for Symptoms of Anxiety and Depression

Hospital Anxiety Depression Scale - HADS (Snaith & Zigmond, 2000) in Polish adaptation by Krejtz (2016) shows the presence and severity of anxiety and depression symptoms in the past week**.** Questionnaire consists of 14 items divided into 2 subscales, 7 items each: HADS-A related to the anxiety and HADS-D related to the depression. Score for each item is from 1 to 4.

Questionnaire for Intrusive and Deliberate Rumination

Assessing of the two types of rumination's escalation is measured by the Event Related Rumination Inventory – ERRI (Cann et al., 2011) in Polish translation by Zięba (Taku et al., 2021). The questionnaire consists of two subscales which measure the extent of intrusive and the deliberate rumination. Each subscale consists of 10 items. Answers are given on 5-point scale (1- *not at all* to 5 = *very often*).

Questionnaire for Type of Cognitive Processing of Trauma

A type of cognitive emotion regulation is measured by the 18-item version of the Cognitive Emotion Regulation Questionnaire (CERQ) prepared by Garnefski & Kraaij (2007) in Polish translation by Marszał-Wiśniewska and Fajkowska (Marszał-Wiśniewska & Fajkowska, 2010). Questionnaire consists of 36 items divided into 9 subscales: *self-blame*, *acceptance*, *rumination*, *positive refocusing*, *refocus on planning*, *positive reappraisal*, *putting into perspective*, *catastrophizing*, *blaming others*. Responses can be given using 5-point scale (1 = *hardly never* to 5 = *always*).

Garnefski showed that cognitive emotion regulation can be grouped into adaptive and non-adaptive regulation strategies. Each strategy reflected in the CERQ is an indicator of negative or positive cognitive processing of trauma.

Negative cognitive processing of trauma relates to the following cognitive emotion regulation strategies: *catastrophizing*, *self-blame*, *blaming others*, *rumination*.

Positive cognitive processing of trauma is associated with the following cognitive emotion regulation strategies: *acceptance*, *refocus on planning*, *positive refocusing*, *positive reappraisal*, *putting into perspective*.

8.3.2 Second Measurement

Interview for PTSD symptom severity

The intensity of PTSD symptoms was assessed in the second stage of the study using the Structured Clinical Interview (SCID-I) module *F* (First, 2004) in Polish adaptation by Popiel et al. (2010) covering all the DSM-IV diagnostic criteria for PTSD. Answers are given on 3-point scale (1 = *false* to 3 = *true*). The Structured Clinical Interview for DSM-IV (SCID) was utilized to ascertain the presence of post-traumatic stress disorder (PTSD) in the respondent. For the purposes of analysis, the answers of the final PTSD symptomps severity were recoded to quantify the intensity of symptoms. Each symptom that the respondent confirmed was assigned a value of 1 if present, resulting in a total possible score of 17.

Questionnaire for PTG and PTD

Posttraumatic growth and posttraumatic depreciation was measured with PTGDI-X inventory, in Polish translation by Zięba (Taku et al., 2021). This questionnaire consists of two subscales, 25 items each that measures five domains of PTG and PTD (personal strength, spiritual and existential change, relating to others, new possibilities, appreciation of life).

Answers are given on 6-point scale (0 = *as a result of the event, I did not experience this change* to 5 = *as a result of the event, I experienced this change on a large scale*).

8.4 Quantitative Analysis of Linguistic Meanings in the Interviews

Interviews conducted at first measurement were recorded and transcribed. Before the analysis, transcriptions were cleaned according to the protocol described in the method section: researcher removed symbols used in phonetic transcriptions and interviewer's questions.

Based on the method presented in the Chapter 6, primary investigator defined words' meanings categories that were hypothesized to predict PTSD, PTG or PTD. These categories are listed below:

Positive reappraisal is the first category that can be identified in the language and was divided in two subcategories: *Insight* and *Causation*.

Insight was specified as a subcategory containing lexical units indicating human intellectual activity related to understanding and finding the meaning of an event, e.g., *think* in: "*I think this event changed me*."

Causation was defined as a subcategory containing lexical units indicating the mental consequences of an event, e.g., *because* in *"Since that event, I have changed my attitude toward life because I know that I cannot control everything."*

Acceptance is the second category that can be noticed in the narratives. A definition that was used to create this words' meanings' category is: Meanings indicating acceptance and coming to terms with the situation and the reality that followed, e.g., *accept* in *"I totally accept this fact and move on.*"

Blaming is the third category which can be noticed in the narratives. A definition used to create a words' meanings category is: lexical units indicating the attribution of blame to someone (or

oneself) for an event, e.g., *blame* in "*It was all his blame because he did not think about the consequences*".

Exaggeration is the fourth category that can be identified. A definition that was used to create words' meanings category is: lexical units indicating qualitative features characterized by a certain drama and exaggeration, e.g., *absolutely* in *"I feel pain in absolutely every part of my body*".

Words' meanings categorized as **Positive reappraisal** or **Acceptance** are the indicators of positive cognitive processing of trauma, whereas **Blaming** and **Exaggeration** category is the indicator of negative cognitive processing of trauma. The result of the methodological process from Chapter 6 are words' meanings categories (see Table 2 for summary).

Table 2

Linguistic Predictors of trauma's aftermath – words' meaning categories, their definitions and examples.

Category's name	Definition	Example
Positive reappraisal – subcategory - *insight*	Lexical units indicating a person's intellectual activity related to understanding and finding the meaning of an event, such as "I think this event changed me."	Think, consider

Positive reappraisal – subcategory- *causation*	Lexical units indicating the mental consequences of an event, e.g., "Since that event, I have changed my attitude to life, because I know that I cannot influence everything."	Because
Acceptance	Lexical units indicating acceptance and coming to terms with the situation and the reality that followed.	Accept, adjust
Blaming	Lexical units indicating the attribution of responsibility for an event to someone (or oneself).	Guilty, blame
Exaggeration	Lexical units indicating exaggeration that focuses on the horror of the event and emphasizing its extremely traumatic nature.	Never, only

8.5 Words' Meanings Frequency Analyses

Acquired corpora consisted of 107553 tokens – words included in the text (*Mean frequency per interview* = 1633.8, *SD* = 1101.8) from which the shorter transcription has 422 tokens whereas longest transcription has 6068 tokens (see appendix A for examples). The result of analysis done in LEM with categories described above (see section 9.4.1) showed that words' meanings that could be included into the category **Acceptance** were used with mean frequency = 0.022%, *SD* = 0.077%, from category **Blaming** *M* = 0.014%, *SD* = 0.035% from subcategory ***Causation*** *M* = 4.49%, *SD* = 0.82% from subcategory ***Insight*** *M* = 1.23%, *SD* = 0.54%, and from category **Exaggeration** *M* = 0.33%, *SD* = 0.16%.

Despite the low number of words belonging to categories **Exaggeration**, **Acceptance** and **Blaming** in the whole corpus, the researcher decided to include them in the analysis, as emphasizing that these strategies were indicated in the narratives.

8.6 Qualitative Analysis

In addition to the quantitative analysis, an analysis of a qualitative nature was used to test the hypotheses defined above. Three experts in psychology were instructed to identify the cognitive emotion regulation strategies outlined by Garnefski (2007) in the participants' narratives during the interview. Their objective was to confirm whether these categories were present in the narrative content. Raters were blind to the study's purpose and to the assessments of the other judges. They were supplied with operational definitions of the strategies, in addition to the coding instructions (see Appendix C). The lead researcher and three raters held a meeting prior to the qualitative analysis to discuss any uncertainties related to the research and coding procedure.

Chapter 9 Results

9.1 PTSD Predictors

First, I report the descriptive statistics and correlations among all the study measures and PTSD symptoms intensity as presented in Table 3.

Table 3

Descriptive Statistics and Correlations with PTSD assesments for Study 1

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. PTSD-I	51.68	16.11												
2. PTSD_II	3.52	2.85	.43*											
3. Anxiety (HADS_A)	16.33	4.74	.75**	.40**										
4. Depression (HADS_D)	12.76	4.46	.64**	.24	.71**									
5. Resiliency	42.88	6.36	-.39*	-.17	-.45**	-.36*								
6. IR	36.59	8.73	.57**	.45**	.58**	.42**	-.12							
7. DR	33.59	6.84	.42**	.06	.24	.22	.13	.39*						
8. PCPT	65.57	11.71	-.26	-.12	-.48**	-.45**	.60**	-.28	.19					
9. NCPT	44.72	8.85	.56**	.30*	.50**	.50**	-.14	.41**	.23	-.20				
10. Acceptance	0.02	0.08	.19	.19	.15	.20	.01	.19	.12	-.10	-.00			
11. Blaming	0.01	0.04	-.11	-.11	-.14	-.12	.06	-.15	-.05	.04	.03	-.09		
12. Exaggeration	0.42	0.17	.19	.24	.12	.11	-.02	.20	-.26	.03	.10	.05	-.06	
13. Positive Reappraisal	5.74	0.96	.37*	-.06	.05	-.09	.03	.29	.23	.07	.04	.21	.04	.26*

Note. M and SD are used to represent mean and standard deviation, respectively. * $p < .05$. ** $p < .01$. PTSD-I = Posttraumatic stress disorder - first measurement; PTSD-II = Posttraumatic stress disorder - second measurement.
IR = Intrusive ruminations; DR = Deliberative ruminations; PCPT = Positive Cognitive Processing of Trauma; NCPT = Negative Cognitive Processing of Trauma.

The second stage of the analysis aimed to determine the answers to each hypothesis concerning the predictors of PTSD. Due to the small number of participants, the basic analysis for answering research questions is a simple linear regression. Results are divided into two parts: (a) type of cognitive processing of trauma as predictor of PTSD and (b) words' meanings as predictors of PTSD.

9.1.1 Type of cognitive processing of trauma as PTSD predictor

9.1.1.1 H1 Negative cognitive processing of trauma is a predictor of PTSD

Negative cognitive processing of trauma as a predictor of PTSD

Linear regression analysis was conducted to examine the relationship between NCPT (a predictor assessed with the questionnaires during the first measurement) and the intensity of PTSD symptoms (the explanatory variable assessed with the interview during the second measurement). The proposed model was well fitted to the data: $F(1,45) = 4.54$, $p < .05$. Based on the regression coefficients, it can be concluded that PTSD symptom intensity is moderately related with the negative processing of trauma ($\beta = .30$, $p < .05$).

This suggests that individuals who engage in strategies involving NCPT may experience more intense PTSD symptoms 6–8 months later. The tested model explains 9.2% of the variance in the explanatory variable. More detailed results are presented in Table 4 and Graph 3.

Table 4

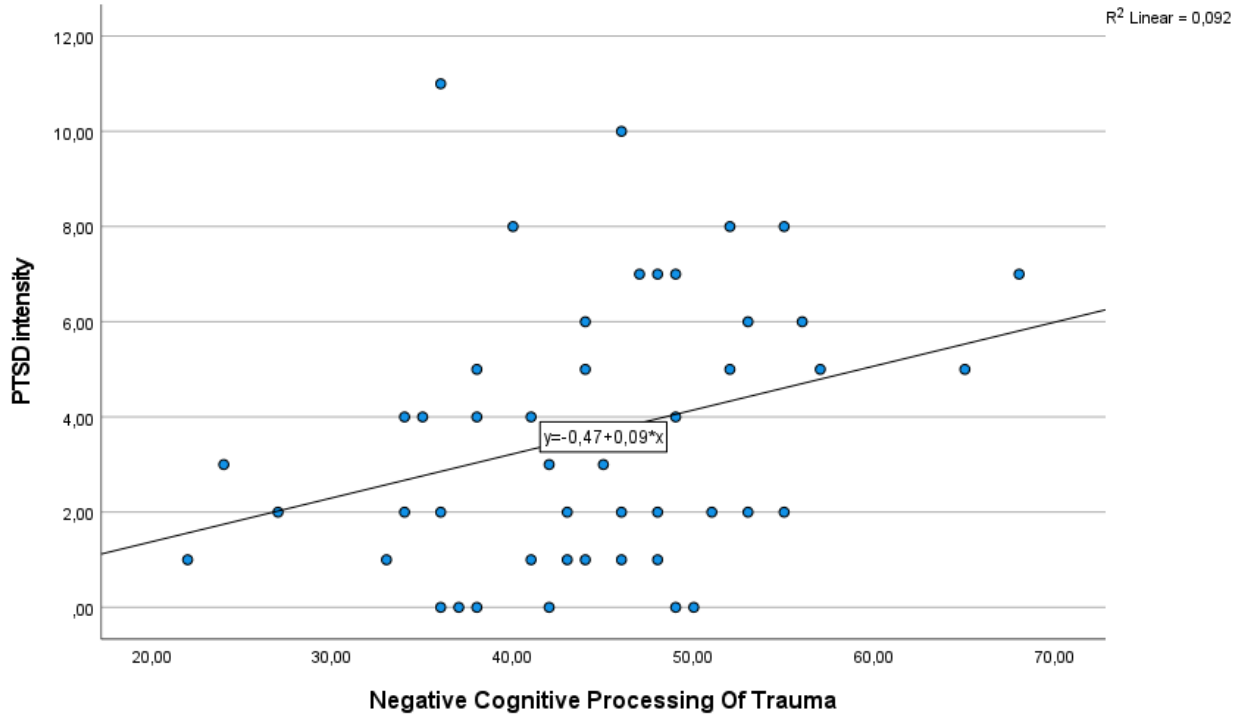
Regression coefficient for NCPT on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 90% CI [LL, UL]	*r*	Fit
(Intercept)	-0.47	[-4.41, 3.48]						
NCPT	0.09*	[0.01, 0.18]	0.30	[0.02, 0.59]	.09	[.00, .24]	.30*	R^2 = .092* 90% CI[.00, .24]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$. NCPT = Negative Cognitive Processing of Trauma.

Graph 3

NCPT as a predictor of PTSD symptoms intensity



In addition to the analyses reported above, I also performed analyses where PTSD symptoms intensity were tested to be predicted by single negative cognitive emotion regulation strategies as assessed with CERQ, i.e. self-blame, blaming others, rumination and catastrophizing. These analyses were carried out as simple linear regressions with the single cognitive emotion regulation strategies as predictors.

Catastrophizing strategy as a predictor of PTSD

Linear regression analysis with catastrophizing strategy as a predictor showed that proposed model was found to be well fitted to the data, with: $F(1,46) = 7.18$, $p < .05$. PTSD symptom intensity was moderately related with catastrophizing strategy: $\beta = .37$, $p < .05$.

It can be interpreted as follows: individuals who engage in catastrophizing strategy may experience more intense PTSD symptoms. The tested model explains 13.8% of the variance in the explanatory variable. More detailed results are presented in Table 5.

Rumination strategy as a predictor of PTSD

Linear regression analysis with rumination strategy as a predictor showed that proposed model was well fitted to the data: $F(1, 46) = 4.93$ and $p < .05$. PTSD symptom intensity is moderately related with rumination strategy: ($\beta = .31$, $p < .05$), indicating that individuals who engage in rumination strategy may experience more intense PTSD symptoms. The tested model explained 9.9% of the variance in the explanatory variable (i.e. PTSD symptoms). More detailed results are presented in Table 6.

Blaming others strategy as a predictor of PTSD

Simple linear regression was used to test whether blaming strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .00$, $F(1,46) = 0.81$; $p = .67$. More details results are presented in Table 7.

Self-blame strategy as a predictor of posttraumatic stress disorder

Simple linear regression was used to test whether self-blame strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .074$, $F(1,46) = 3.57$; $p = .65$. More detailed results are presented in Table 8.

Table 5

Regression coefficient for catastrophizing strategy on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	-0.05	[-2.92, 2.82]						
CC	0.34*	[0.09, 0.60]	0.37	[0.09, 0.65]	.14	[.01, .32]	.37*	R^2 = .138* 95% CI[.01,.32]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CC = CERQ: Catastrophizing strategy.

Table 6

Regression coefficient for the rumination strategy on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	beta	beta 95% CI [LL, UL]	sr2	sr2 95% CI [LL, UL]	r	Fit
(Intercept)	-1.05	[-5.36, 3.26]						
CR	0.34*	[0.03, 0.65]	0.31	[0.03, 0.60]	.10	[.00, .28]	.31*	R^2 = .099* 95% CI[.00,.28]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CR = CERQ: Rumination strategy.

Table 7

Regression coefficient for the blaming others strategy on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	beta	beta 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	r	Fit
(Intercept)	3.99**	[2.04, 5.93]						
CBO	-0.04	[-0.23, 0.15]	-0.06	[-0.36, 0.24]	.00	[.00, .10]	-.06	R^2 = .004 95% CI[.00,.10]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CBO = CERQ: Blaming Others strategy.

Table 8

Regression coefficient for self-blame strategy on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	1.69	[-0.51, 3.90]						
CSB	0.18	[-0.01, 0.38]	0.27	[-0.02, 0.56]	.07	[.00, .24]	.27	R^2 = .074
								95% CI[.00,.24]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * p < .05. ** p < .01. CSB = CERQ: Self-blame strategy.

9.1.1.2 H2 Positive cognitive processing of trauma is a negative predictor of PTSD

Positive cognitive processing of trauma as a negative predictor of PTSD

Simple linear regression was used to test whether positive cognitive processing of trauma significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .02$, $F(2,44) = 0.7$; $p = .41$. More detailed results are presented in Table 9.

In addition to the analyses reported above, I conducted analyses were PTSD symptoms intensity were tested to be predicted by single positive cognitive emotion regulation strategies as assessed with CERQ, i.e. acceptance, refocus on planning, positive reappraisal, putting into perspective and positive refocusing. These analyses were carried out as simple linear regressions with the single cognitive emotion regulation strategies as predictors.

Acceptance strategy as a predictor of PTSD

Simple linear regression was used to test whether acceptance strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = -.022$, $F(1,44) = 0.001$; $p = .98$. More detailed results are presented in Table 10.

Refocus on planning strategy as a predictor of PTSD

Simple linear regression was used to test whether refocus on planning strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .00$, $F(1,44) = 0.001$, $p = .94$. More detailed results are presented in Table 11.

Positive reappraisal strategy as a predictor of PTSD

Simple linear regression was used to test whether positive reappraisal strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .01$, $F(1,44) = 0.46$, $p = .50$. More detailed results are presented in Table 12.

Putting into perspective strategy as a predictor of posttraumatic stress disorder.

Simple linear regression was used to test whether putting into perspective strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .02$, $F(1,44) = 0.82$, $p = .37$. More detailed results are presented in Table 13.

Positive refocusing strategy as a predictor of posttraumatic stress disorder.

Simple linear regression was used to test whether positive refocusing strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .03$, $F(1,44) = 1,19$, $p = .28$. More detailed results are presented in Table 14.

Table 9

Regression coefficient for PCPT on the PTSD intensity.

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	ssr_2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	5.66*	[0.69, 10.62]						
PCPT	-0.03	[-0.10, 0.04]	-0.12	[-0.42, 0.17]	.02	[.00, .14]	-.12	R^2 = .015
								95% CI[.00,.14]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. PCPT = Positive Cognitive Processing of Trauma.

Table 10

Regression coefficient for acceptance strategy on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	3.56	[-0.61, 7.73]						
CA	0.00	[-0.26, 0.27]	0.00	[-0.30, 0.30]	.00	[.00, 1.00]	.00	R^2 = .000 95% CI[.00,1.00]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * p < .05. ** p < .01. CA = CERQ: Acceptance strategy.

Table 11

Regression coefficient for refocus on planning strategy on PTSD intensity.

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	3.49	[-0.20, 7.18]						
CROP	0.01	[-0.26, 0.27]	0.01	[-0.29, 0.31]	.00	[.00, .03]	.01	R^2 = .000
								95% CI[.00,.03]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * p < .05. ** p < .01. CROP = CERQ: Refocus on planning strategy.

Table 12

Regression coefficient for positive reappraisal strategy on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	4.59**	[1.57, 7.60]						
CPRL	-0.08	[-0.31, 0.15]	-0.10	[-0.40, 0.20]	.01	[.00, .13]	-.10	R^2 = .010 95% CI[.00,.13]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * p < .05. ** p < .01. CPRL = CERQ: Positive reappraisal strategy.

Table 13

Regression coefficient for putting into perspective strategy on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	ssr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	5.04**	[1.75, 8.34]						
CPIP	-0.11	[-0.37, 0.14]	-0.13	[-0.43, 0.16]	.02	[.00, .15]	-.13	R^2 = .018 95% CI[.00,.15]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * p < .05. ** p < .01. CPIP = CERQ: Putting into Perspective strategy.

Table 14

Regression coefficient for positive refocusing strategy on PTSD intensity

Predictor	b	b 95% CI [LL, UL]	beta	beta 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	r	Fit
(Intercept)	4.98**	[2.32, 7.65]						
CPRG	-0.11	[-0.32, 0.09]	-0.16	[-0.46, 0.14]	03	[.00, .17]	-.16	R^2 = .026 95% CI[.00,.17]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CPRG = CERQ: Positive Refocusing strategy.

9.1.2 Linguistic meanigs as a predictor

9.1.2.1 H3 Blaming words' meanings are predictors of posttraumatic stress disorder.

Simple linear regression was used to test whether blaming words' meanings (a predictor extracted from interviews performed during the first measurement) significantly predicted PTSD intensity, as assessed with the interview during the second measurement. The overall regression was not statistically significant: $R^2 = .01$, $F(1,48) = 0.57$, $p = .45$. More detailed results are presented in Table 15. However, considering the low frequency of blaming words' meanings in the narratives the findings on this category should be treated with caution.

9.1.2.2 H4 Exaggeration words' meanings are predictors of posttraumatic stress disorder.

Simple linear regression was used to test whether exaggeration words' meanings significantly predicted PTSD intensity. The overall regression was not statistically significant $R^2 = .06$, $F(1,47) = 2,9$, $p = .1$. More details are presented in Table 16.

Table 15

Regression coefficient for blaming words' meanings in narrative on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	3.63**	[2.76, 4.50]						
Blaming	-8.70	[-31.86, 14.46]	-0.11	[-0.40, 0.18]	.01	[.00, .13]	-.11	R^2 = .012 95% CI[.00,.13]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$.

Table 16

Regression coefficient for exaggeration words' meanings on PTSD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	1.78	[-0.43, 3.99]						
Exaggeration	4.04	[-0.74, 8.81]	0.24	[-0.04, 0.52]	.06	[.00, .21]	.24	R^2 = .057 95% CI[.00,.21]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* indicates $p < .05$. ** indicates $p < .01$.

9.1.3 Hierarchical regression analyses of PTSD model

Despite the low sample size, I decided to conduct hierarchical regression. The intensity of each type of cognitive processing of trauma were entered in the first step to verify its impact on PTSD intensity. In the second step, the linguistic categories (i.e. the frequency of words' meanings assigned to two subtypes of cognitive processing of trauma) were entered simultaneously. Table 3 presents the hierarchical multiple regression analyses in which the independent variables were PCPT and NCPT in the first step, and then PCPT, NCPT, blaming words' meanings and exaggerating words 'meanings in the second step.

The results of the first step of the analysis revealed a model that was not statistically significant ($p > .05$). Additionally, the R^2 value of .1 associated with this regression model suggested that PCPT and NCPT accounted for only 9.6% of the variation in PTSD symptom intensity, which means that 90.4% of the variation cannot be explained by the type of cognitive processing of trauma alone.

The results of the second step of the analysis revealed that this model was also not statistically significant ($p > .05$). The R^2 change value was not significant $F(4,42) = 1.9$. The addition of exaggeration and blaming words' meanings to the first block model explained 6% of the variation in PTSD symptom intensity, which means that 85% of the variation in PTSD symptom intensity could not be explained by the type of cognitive processing used for trauma and the linguistic meanings in narrative alone. The results are presented in Table 17.

Table 17

Hierarchical Regression Results for PTSD in the first study

Predictor	*B*	95% CI for *B*		*SE B*	Beta	R^2	ΔR^2
		LL	UL				
Step 1						.096	0.96
Constant	0.82	-6.06	7.7	3.41			
NCPT	0.09	0.0	.18	.045	0.29		
PCPT	-0.02	-.009	.06	.036	-0.07		
Step 2						0.15	0.06
Constant	-0.88	-8.05	6.29	3.56			
NCPT	0.08	-.01	.17	0.05	0.26		
PCPT	-0.01	-.08	.06	0.04	-0.04		
Blaming	-4.02	-27.15	19.1	11.46	-0.05		
Exaggeration	3.97	-1.1	9.03	2.51	0.23		

Note: NCPT = Negative Cognitive Processing of Trauma; PCPT = Positive Cognitive Processing of Trauma.

9.1.4 Summary

Linear regression analysis was done, in which predictors were the NCPT or the PCPT. Only NCPT was a significant predictor of PTSD. Further analysis showed thatfrom all the NCPT substrategies, only catastrophizing and rumination significantly predicted PTSD. Within the group of PCPT strategies, only acceptance significantly predicted PTSD symptoms. Nosupport was found for the hypothesized relationship between the frequency of lexical categories in the narrratives and the PTSD intensity.

9.2 PTD Predictors

The descriptive statistics and correlations among all the independent variable and posttraumatic depreciation intensity are presented in Table 18.

Table 18

Descriptive statistics and correlations for Study 1 for PTD

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. PTD	47.56	22.46														
2. PTG	75.98	28.00	-.14													
3. PTSD-II	3.52	2.85	.58**	.22												
4. Anxiety (HADS-A)	16.33	4.74	.56**	.01	40**											
5. Depression (HADS-D)	12.76	4.46	.59**	.06	.24	.71**										
6. Resiliency	42.88	6.36	-.34*	.33*	-.17	-.45**	-.36*									
7. IR	36.59	8.73	.39*	.09	.45**	.58**	.42**	-.12								
8. DR	33.59	6.84	.14	.16	.06	.24	.22	.13	.39*							
9. PCPT	65.57	11.71	-.32*	.32*	-.12	-.48**	-.45**	.60**	-.28	19						
10. NCPT	44.72	8.85	.33*	.22	.30*	.50**	.50**	-.14	.41**	.23	-.20					
11. PTSD-I	51.68	16.11	.48**	.08	.43*	.75**	.64**	-.39*	.57**	.42	-.26	.56**				
10. Acceptance	0.02	0.08	.49**	-.11	.19	.15	.20	.01	.19	.12	.10	-.00	.19			
11. Blaming	0.01	0.04	-.08	.03	.1	.14	-.12	.06	-.15	.05	.04	.03	.11	-.09		
12. Exaggeration	0.42	0.17	.43**	.24	.24	.12	.11	-.02	.20	.26	.03	.10	.19	.05	.06	
13. Positive Reappraisal	5.74	0.96	.18	-.06	-.06	.05	-.09	.03	.29	.23	.07	.04	.37*	.21	,04	.26*

Note. M and *SD* are used to represent mean and standard deviation, respectively.* $p < .05$. ** $p < .01$. PTD = Posttraumatic depreciation; PTG = Posttraumatic growth, PTSD-II = Posttraumatic stress disorder - second measurement; IR = Intrusive ruminations; DR = Deliberative ruminations; PCPT = Positive Cognitive Processing of Trauma; NCPT = Negative Cognitive Processing of Trauma; PTSD-I = Posttraumatic stress disorder - first measurement.

The second stage of the analysis aimed to test each hypothesis about the predictors of PTD. Simple linear regressions was conducted for each predictor to examine its relationship with PTD intensity. Results are divided into two parts: (a) type of cognitive processing of trauma as predictor and (b) words' meanings as predictor.

9.2.1 Type of cognitive processing of trauma as a predictor of PTD

9.2.1.1 H5 Positive cognitive processing of trauma (PCPT) is a negative predictor of PTD

Positive cognitive processing of trauma as a negative predictor of PTD

Linear regression analysis was conducted with PCPT as the predictor variable and PTD intensity as the explanatory variable. The proposed model was well fitted to the data: $F(1,40) = 4.71$, $p < .05$. Based on the regression coefficients, it can be concluded that PTD intensity is moderately negatively related to PCPT: $\beta = -.32$, $p < .05$.

The application of positive cognitive processing of trauma type was related to lower levels of PTD. The tested model explains 10.5% of the variance in the explanatory variable. More detailed results are presented in Table 19 and Graph 4.

Table 19

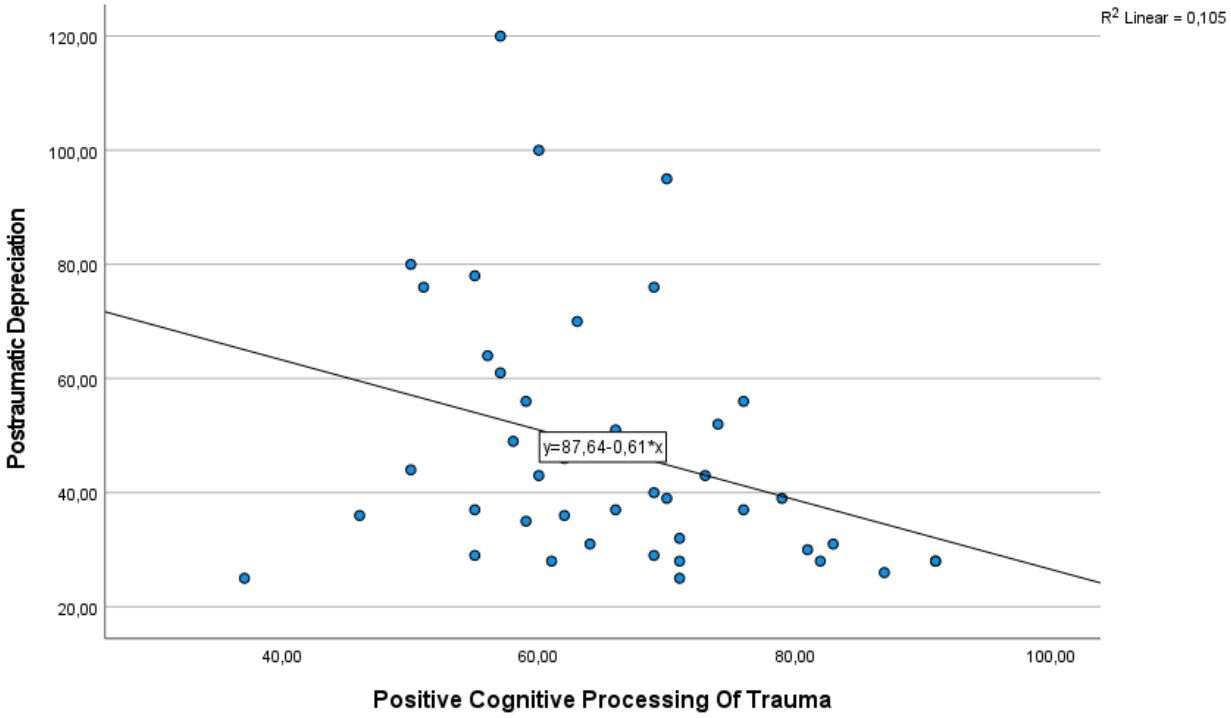
Regression coefficient for PCPT on PTD

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 90% CI [LL, UL]	*r*	Fit
(Intercept)	87.64**	[49.63, 125.65]						
PCPT	-0.61*	[-1.18, -0.04]	-0.32	[-0.63, -0.02]	.11	[.00, .26]	-.32*	R^2 = .105* 90% CI[.00,.26]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* p < .05. ** p < .01. PCPT = Positive Cognitive Processing of Trauma.

Graph 4

PCPT as a predictor of PTD symptoms intensity



Moreover, I carried out supplementary analyses where PTD symptoms intensity were predicted by single positive cognitive emotion regulation strategies as assessed with CERQ, i.e. positive refocusing, acceptance, positive reappraisal, putting into perspective and refocus on planning. These analyses were carried out as simple linear regressions with the single cognitive emotion regulation strategies as predictors.

Positive refocusing strategy as a predictor of PTD

Linear regression analysis with positive refocusing strategy showed that proposed model was found to be well fitted to the data, with: $F(1,40) = 4.8$, $p < .05$. Based on the regression coefficients, it can be concluded that the intensity of PTD is moderately related with the positive refocusing: $\beta = -,33$. $p < .05$. Individuals who applied positive refocusing strategy experienced

lower levels of PTD. The tested model explains 10.7% of the variance in the explanatory variable. More detailed results are presented in Table 20.

Acceptance strategy as a predictor of PTD

Simple linear regression was used to test whether the acceptance strategy significantly predicted PTD intensity. The overall regression was not statistically significant: $R^2 = .08$, $F(1,40) = 3.26$, $p = .079$. More detailed results are presented in Table 21.

Positive reappraisal on planning strategy as a predictor of PTD

Simple linear regression was used to test whether the positive reappraisal strategy significantly predicted PTD intensity. The overall regression was not statistically significant: $R^2 = .06$, $F(1,40) = 2.43$, $p = .127$. More detailed results are presented in Table 22.

Putting into perspective strategy as a predictor of PTD

Simple linear regression was used to test whether the putting into perspective strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .04$, $F(1,40) = 1.549$, $p = .221$. More detailed results are presented in Table 23

Refocus on planning strategy as a predictor of PTD

Simple linear regression was used to test whether the refocus on planning strategy significantly predicted PTG intensity. The overall regression was not statistically significant: $R^2 = .00$, $F(1,40) = 0.0$, $p = .99$. More detailed results are presented in Table 24.

Table 20

Regression coefficient for positive refocusing strategy on PTD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	68.60**	[47.97, 89.23]						
CPRG	-1.73*	[-3.32, -0.13]	-0.33	[-0.63, -0.03]	.11	[.00, .30]	-.33*	R^2 = .107* 95% CI[.00,.30]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$. CERQ: Positive Refocusing strategy.

Table 21

Regression coefficient for acceptance strategy on PTD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	76.15**	[43.32, 108.98]						
CA	-1.89	[-4.01, 0.23]	-0.27	[-0.58, 0.03]	.08	[.00, .26]	-.27	R^2 = .075
								95% CI[.00,.26]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CA = CERQ: Acceptance strategy.

Table 22

Regression coefficient for positive reappraisal strategy on PTD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	65.19**	[41.21, 89.18]						
CPRL	-1.42	[-3.26, 0.42]	-0.24	[-0.55, 0.07]	.06	[.00, .23]	-.24	R^2 = .057 95% CI[.00,.23]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$. CPRL = CERQ: Positive Reappraisal strategy.

Table 23

Regression coefficient for putting into perspective strategy on PTD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	62.77**	[36.96, 88.59]						
CPIP	-1.24	[-3.25, 0.77]	-0.19	[-0.51, 0.12]	.04	[.00, .20]	-.19	R^2 = .037 95% CI[.00,.20]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CPIP = CERQ: Putting into Perspective strategy.

Table 24

Regression coefficient for refocus on planning strategy on PTD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	47.58**	[16.25, 78.91]						
CROP	-0.01	[-2.26, 2.24]	-0.00	[-0.32, 0.32]	.00	[.00, 1.00]	-.00	R^2 = .000 95% CI[.00,1.00]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CROP = CERQ: Refocus on Planning strategy.

9.2.1.2 H6 Negative cognitive processing of trauma (NCPT) is a predictor of PTD

Negative cognitive processing of trauma as a predictor of PTD

Linear regression analysis was conducted with NCPT as the predictor and PTD intensity as the outcome variable. The proposed model was found to be well fitted to the data, with: $F(1,40) = 4.87, p < .05$. Based on the regression coefficients, it can be concluded that the intensity of PTD is moderately related with the NCPT: $\beta = .33$, $p < .05$.

Individuals who who engaged in strategies involving NCPT experienced higher levels of PTD 6–8 months later. The tested model explains 10.8% of the variance in the explanatory variable. The results are presented in Table 25 and Graph 4.

Table 25

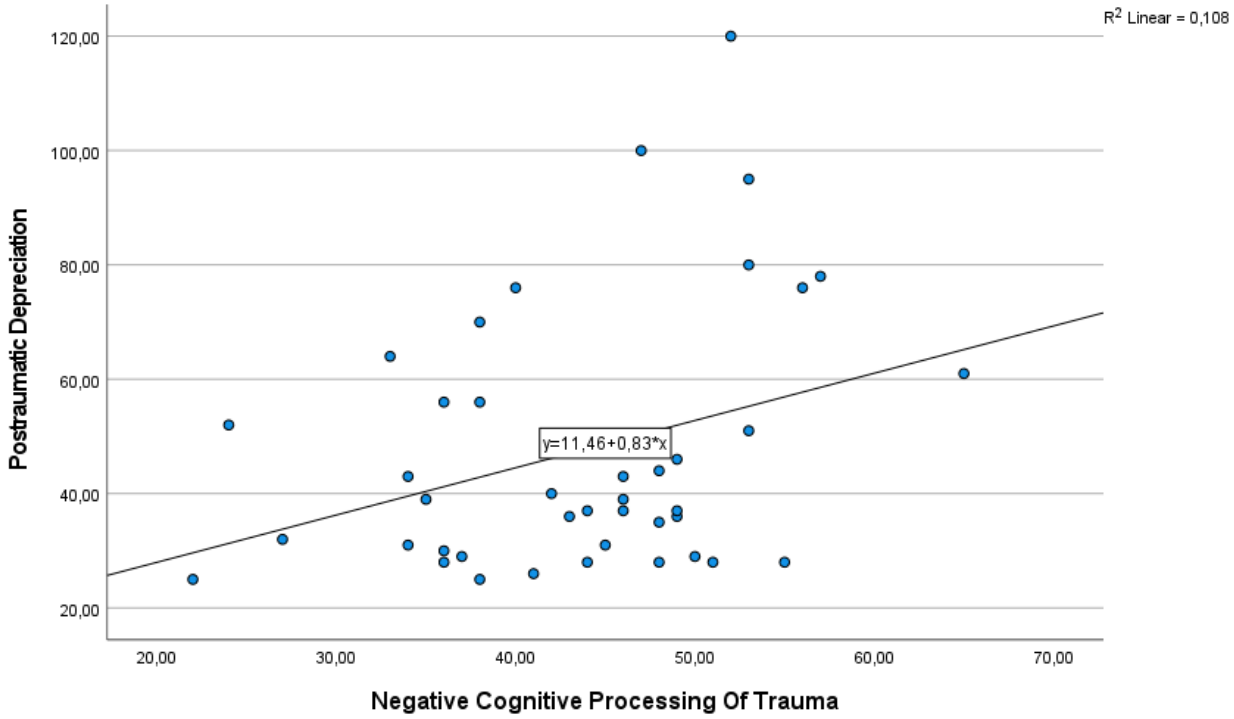
Regression coefficient for NCPT on PTD

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 90% CI [LL, UL]	*r*	Fit
(Intercept)	11.46	[-22.23, 45.14]						
NCPT	0.83*	[0.07, 1.58]	0.33	[0.03, 0.63]	.11	[.00, .26]	.33*	R^2 = .108*
								90% CI[.00,.26]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. NCPT = Negative Cognitive Processing of Trauma.

Graph 4

Negative cognitive processing of trauma as a predictor of posttraumatic depreciation



In addition to the analyses reported above, I also performed analyses where PTD symptoms intensity were tested to be predicted by single negative cognitive emotion regulation strategies as assessed with CERQ, i.e. catastrophizing, rumination, self-blame and blaming others. These analyses were carried out as simple linear regressions with the single cognitive emotion regulation strategies as predictors.

Catastrophizing strategy as a predictor of PTD

Linear regression analysis with the catastrophizing strategy showed that the proposed model was found to be well fitted to the data, with: $F(1, 40) = 4.24$, $p < .05$. Based on the regression coefficients, it can be concluded that the intensity of PTD is moderately related with the catastrophizing strategy: $\beta = .31$, $p < .05$.

Person who applied catastrophizing strategy experienced higher level of PTD. The tested model explains 9.6% of the variance in the outcome variable. The results are presented in Table 26.

Rumination strategy as a predictor of PTD

Linear regression analysis with the rumination strategy as a predictor showed that the proposed model was found to be well fitted to the data, with: $F(1, 40) = 4.29$, $p < .05$. Based on the regression coefficients, it can be concluded that the intensity of PTD is moderately related with the rumination: $\beta = .31$, $p < .05$.

Individuals who applied rumination strategy experienced higher level of PTD. The tested model explains 9.7% of the variance in the outcome variable. More detailed results are presented in Table 27.

Self-blame strategy as a predictor of PTD

Linear regression analysis with the self-blame strategy as a predictor shows that the proposed model was found to be well fitted to the data, with: $F(1, 40) = 7.60$, $p <.01$. Based on the regression coefficients, it can be concluded that the intensity of PTD is moderately related with the self-blame $\beta = ,40$, $p < .01$.

Person who applied self-blame strategy experienced higher level of PTD. The tested model explains 16% of the variance in the outcome variable. More detailed results are presented in Table 28.

Blaming others strategy as a predictor of PTD

Simple linear regression was used to test whether blaming others strategy significantly predicted PTD intensity. The overall regression was not statistically significant: $R^2 = .02$, $F(1, 40) = .80$, $p = .37$. More detailed results are presented in Table 29.

Table 26

Regression coefficient for catastrophizing strategy on PTD

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	24.14*	[0.23, 48.05]						
CC	2.22*	[0.04, 4.39]	0.31	[0.01, 0.61]	.10	[.00, .28]	.31*	R^2 = .096* 95% CI[.00,.28]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CC = CERQ: Catastrophizing strategy.

Table 27

Regression coefficient for rumination strategy on PTD

Predictor	*B*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	11.96	[-23.35, 47.28]						
CR	2.63*	[0.06, 5.20]	0.31	[0.01, 0.61]	.10	[.00, .28]	.31*	R^2 = .097* 95% CI[.00,.28]

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CR = CERQ: Rumination strategy.

Table 28

Regression coefficient for self-blame strategy on PTD

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95 CI [LL, UL]	*r*	Fit
(Intercept)	25.99**	[8.94, 43.05]						
CSB	2.04**	[0.55, 3.54]	0.40	[0.11, 0.69]	.16	[.01, .35]	.40**	R^2 = .160** 95% C[.01,.35]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CSB = CERQ: Self-blame strategy.

Table 29

Regression coefficient for blaming others strategy on PTD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95%CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	54.07**	[37.63, 70.51]						
CBO	-0.73	[-2.37, 0.91]	-0.14	[-0.46, 0.18]	.02	[.00, .16]	-.14	R^2 = .020 95% CI[.00,.16]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CBO = CERQ: Blaming Others strategy.

9.2.2 Linguistic meanigs as predictors of PTD

9.2.2.1 H7 Blaming words' meanings are predictors of PTD

Simple linear regression was used to test if blaming words' meanings extracted from interviewes during the first measurement significantly predicted PTSD intensity, as assessed during the second measurement. The overall regression was not statistically significant: R^2= ,00, $F(1, 41) = 0.26$, $p = .61$. More detailed results are presented in Table 30.

9.2.2.2 H8 Exaggeration words' meanings are predictors of PTD

Linear regression analysis was conducted with the frequency of words' meanings indicating **Exaggeration** in the narrative and PTD intensity as the explanatory variable. The proposed model was well fitted to the data: $F(1, 41) = 9.19$, $p < .05$. Based on the regression coefficients, it can be concluded that PTD intensity is moderately related to use of words' meanings indicating exaggeration: $\beta = .43$, $p < .01$; in particular people using words' meanings that indicate exaggeration during the interview about trauma experienced higher levels of PTD. The tested model explains 18.3% of the variability in the outcome variable. More detailed results are presented in Table 31 and Graph 5.

Table 30

Regression coefficient for blaming words' meanings on PTD intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	48.15**	[40.79, 55.50]						
Blaming	-49.49	[-245.99, 147.01]	-0.08	[-0.39, 0.24]	.01	[.00, .12]	-.08	R^2 = .006 95% CI[.00,.12]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01.

Table 31

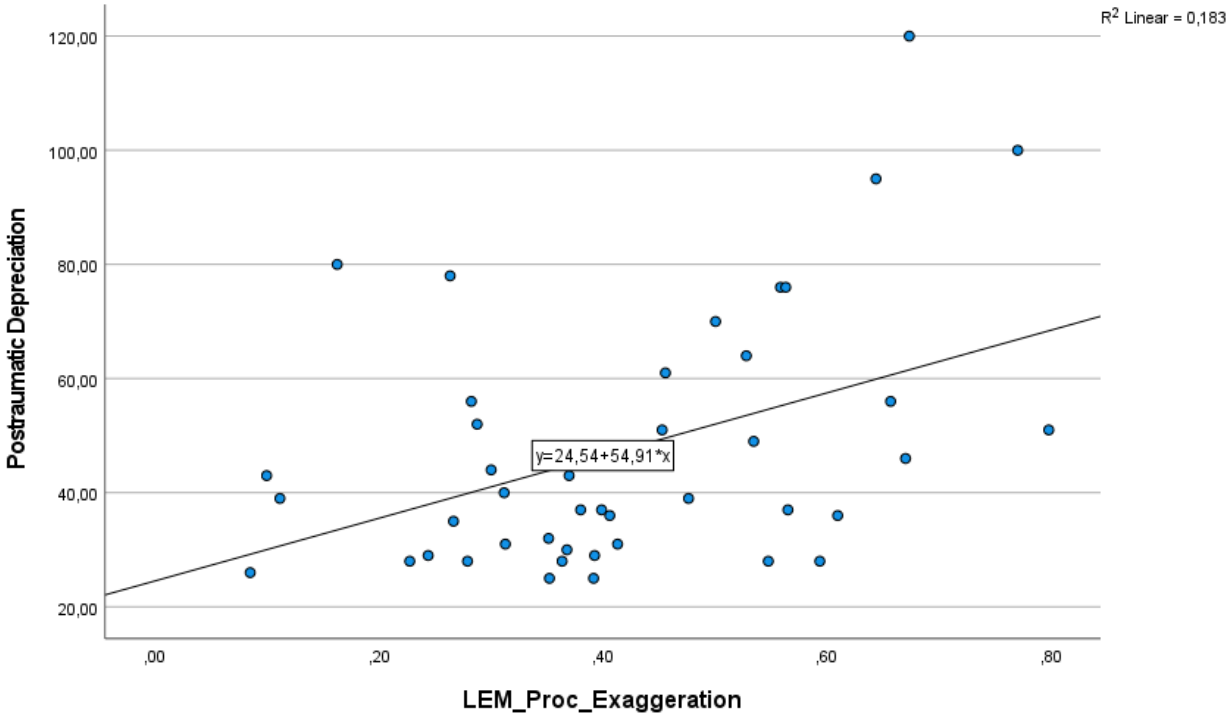
Regression coefficient for exaggeration words' meanings on PTD intensity

Predictor	*b*	b 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 90% CI [LL, UL]	*r*	Fit
(Intercept)	24.54**	[7.95, 41.13]						
Exaggeration	54.91**	[18.32, 91.49]	0.43	[0.14, 0.71]	.18	[.04, .34]	.43**	R^2 = .183** 90% CI[.04,.34]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01.

Graph 5

Exaggeration words' meaning as a predictor of PTD intensity



9.2.3 Hierarchical regression analyses of PTD model

To answer which type of cognitive processing of trauma is a predictor of PTD intensity, a hierarchical linear regression analysis was conducted, in addition to the linear regression analyses reported above.

In the first step, PCPT and NCPT were entered to verify its impact on PTD. This analysis revealed that the model was statistically significant ($p < .05$). Additionally, the R^2 value of .17 associated with this regression model suggested that the positive and negative cognitive processing of trauma accounts for 17% of the variation in PTSD symptoms intensity, which means that 83 % cannot be explained by the type of cognitive processing of trauma alone.

In the second step, the linguistic categories: **Exaggeration** and **Blaming** meanings were entered to the model in addition to PCPT and NCPT. The results revealed that this model was also statistically significant ($p < .05$). The R^2 change value: $F(4,37) = 4.13$ was statistically significant ($p < .05$). After the addition of two linguistic categories: **Exaggeration** and **Blaming** to the model, they accounted for 14% of the variation in PTD intensity, which means that 69% of the variation in PTG symptoms intensity can't be explained by the type of cognitive processing of trauma and linguistic categories in narrative alone. More detailed results are presented in Table 32.

9.2.4 Summary

As expected, both types of cognitive processing of trauma have considerable influence on the development of PTD. NCPT was a positive and PCPT a negative predictor of PTD. Similarly to the PTSD analysis, I checked if any of single cognitive processing of trauma strategies have significant impact on the result. For PCPT, positive refocusing was the only significant strategy and for NCPT there were three of them: catastrophizing, rumination and self-blame (the self-

blame explained the largest proportion of variability). As expected in the hypothesis 8, **Exaggeration** words' meanings category was shown to be a significant predictor of PTD intensity.

Table 32

Hierarchical Regression Results for PTD intensity

Predictor	*B*	95% CI for *B*		*SE B*	Beta	R^2	$\Delta R2$
		LL	UL				
Step 1						0.17	0.17*
Constant	50.51	-5.89	106.91	27.88			
NCPT	0.67	-0.1	1.43	0.38	0.27		
PCPT	-0.49	-1.06	0.08	0.28	-0.26		
Step 2						0.31	0.14*
Constant	30.06	-25.16	85.27	27.25			
NCPT	0.58	-0.14	1.3	0.36	0.23		
PCPT	-0.41	-0.95	0.13	0.27	-0.22		
Blaming	-33.2	-207.45	141.05	86	-0.05		
Exaggeration	47.03	10.89	83.16	17.84	0.37*		

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * p < .05. ** p < .01. 01 NCPT = Negative Cognitive Processing of Trauma; PCPT = Positive Cognitive Processing of Trauma.

9.3 PTG Predictors

In the first step correlation analyses of all variables were performed (see Table 33). The second stage of the analysis aimed to answer each hypothesis about the predictors of PTG intensity, and as in the previous analysis, simple linear regression analysis was used. Results are divided into two parts: (a) type of cognitive processing of trauma as predictor and (b) words' meanings as predictor.

Table 33

Descriptive statistics and correlations for Study 1 for PTG

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. PTG	5.98	28.00														
2. PTD	47.56	22.46	-.14													
3. PTSD-II	3.52	2.85	.22	.58**												
4. Anxiety	16.33	4.74	.01	.56**	.40**											
5.Depression	2.76	4.46	.06	.59**	.24	.71**										
6. Resiliency	2.88	.36	.33*	.34*	-.17	-.45**	-.36*									
7. IR	6.59	.73	.09	.39*	.45**	.58**	.42**	-.12								
8. DR	3.59	.84	.16	.14	.06	.24	.22	.13	.39*							
9. NCPT	5.57	1.71	.32*	.32*	-.12	-.48**	-.45**	.60**	-.28	.19						
10. PCPT	4.72	.85	.22	.33*	.30*	.50**	.50**	-.14	.41**	.23	.20					
11. PTSD-I	1.68	6.11	.08	.48**	.43*	.75**	.64**	-.39*	.57**	.42**	.26	.56**				
12. LA	.02	.08	.11	.49**	.19	.15	.20	.01	.19	.12	.10	-.00	.19			
13. LB	.01	.04	.03	.08	-.11	-.14	-.12	.06	-.15	-.05	.04	.03	.11	.09		
14. LE	.42	.17	.24	.43**	.24	.12	.11	-.02	.20	-.26	.03	.10	.19	.05	.06	
15. LPR	.74	.96	.06	.18	-.06	.05	-.09	.03	.29	.23	.07	.04	.37*	.21	.04	.26*

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. * $p < .05$. ** $p < .01$. PTG = Posttraumatic growth; PTD = Posttraumatic depreciation; IR = Intrusive ruminations; DR = Deliberative ruminations; NCPT = Negative Cognitive Processing of Trauma; PCPT = Positive Cognitive Processing of Trauma; PTSD-I = Posttraumatic stress disorder - first measurement; PTSD-II = Posttraumatic stress disorder - second measurement = LEM: Acceptance; LB = LEM: Blaming; LE = LEM: Exaggeration; LE = LEM = Positive Reappraisal.

9.3.1 Type of cognitive processing of trauma as a predictor of PTG

9.3.1.1 H9 Positive cognitive processing of trauma (PCPT) is a predictor of PTG

Positive cognitive processing of trauma as a predictor of PTG

Linear regression analysis was conducted with PCPT as predictor and PTG intensity as the explanatory variable. The proposed model was well fitted to the data: $F(1, 43) = 4.83$, $p < .05$. Based on the regression coefficients, it can be concluded that the PTG intensity is moderately related to the positive cognitive processing of trauma $\beta = 0.32$; $p < .05$.

This suggests that individuals who applied positive cognitive processing of trauma strategies experiencd higher levels of PTG. The tested model explains 10.1% of the variance in the outcome variable. More detailed results are presented in the Table 34 and Graph 6.

Table 34

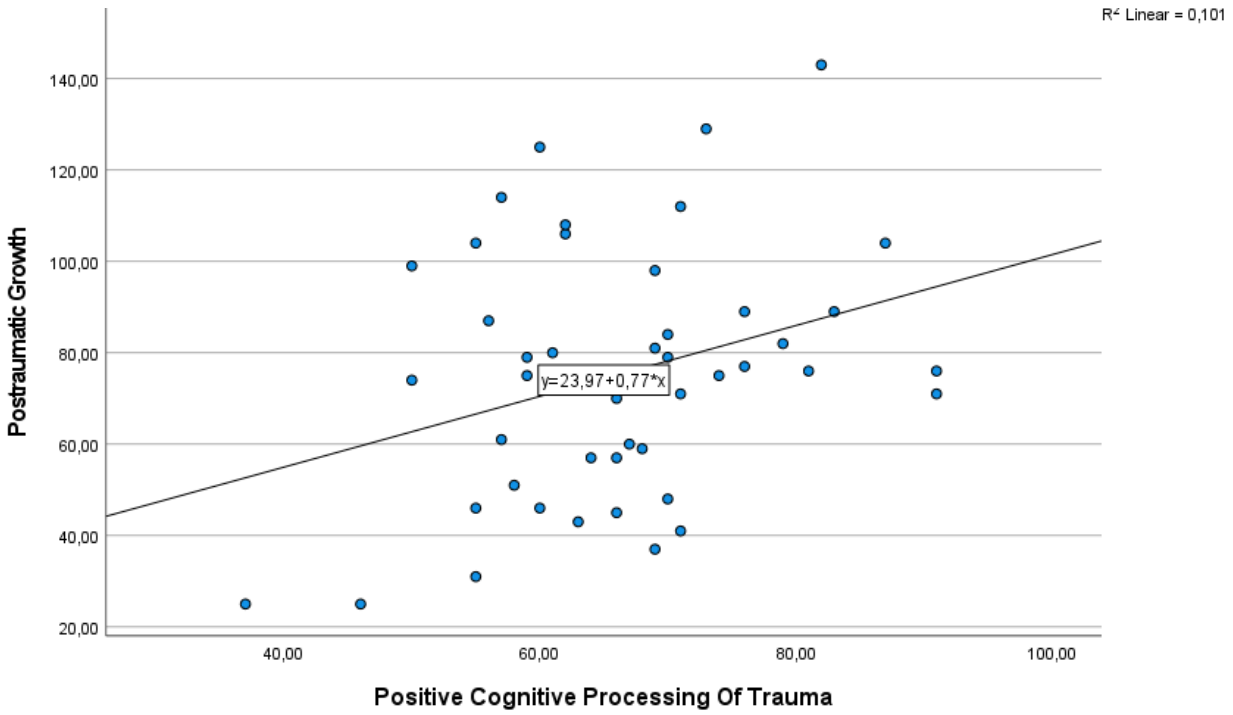
Regression coefficient for PCPT on PTG intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 90% CI [LL, UL]	*r*	Fit
(Intercept)	23.97	[-23.84, 71.79]						
PCPT	0.77*	[0.06, 1.49]	0.32	[0.03, 0.61]	.10	[.00, .25]	.32*	R^2 = .101* 90% CI[.00,.25]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$. PCPT = Positive Cognitive Processing of Trauma.

Graph 6

PCPT as a predictor of PTG intensity



In addition to the analyses reported above, I also conducted analyses were PTG symptoms intensity were tested to be predicted by single positive cognitive emotion regulation strategies as assessed with CERQ, i.e. acceptance, positive reappraisal, positive refocusing, putting into perspective and refocus on planning. These analyses were carried out as simple linear regressions with single cognitive emotion regulation strategies as predictors.

Acceptance strategy as a predictor of posttraumatic growth (PTG) intensity

Linear regression analysis with acceptance strategy as a predictor and PTG as an explanatory variable showed that the proposed model was well fitted to the data: $F(1, 43) = 5.59$, $p < .05$. Based on the regression coefficients, it can be concluded that the PTG intensity is moderately related with the acceptance strategy: $\beta = .34$, $p < .05$.

Individuals who applied the acceptance strategy experienced higher levels of PTG. The tested model explains 11.5% of the variance in the outcome variable. More detailed results are presented in Table 35.

Positive reappraisal as a predictor of PTG

Simple linear regression was used to test whether positive reappraisal strategy significantly predicted PTG intensity. The overall regression was not statistically significant: R^2 = .05, $F(1, 43) = 2.35$, p = .13. More detailed results are presented in Table 36.

Positive refocusing strategy as a predictor of PTG

Simple linear regression was used to test whether positive refocusing significantly predicted PTG intensity. The overall regression was not statistically significant R^2 = .019, $F(1,43) = .85$; p = .36. More detailed results are presented in Table 37.

Puttng into perspective strategy as a predictor of PTG

Simple linear regression was used to test whether the putting into perspective strategy significantly predicted PTG intensity. The overall regression was not statistically significant: R^2 = .006, $F(1, 43) = .26$, p = .61 More detailed results are presented in Table 38.

Refocus on planning strategy as a predictor of PTG

Simple linear regression was used to test whether the refocus on planning strategy significantly predicted PTG intensity. The overall regression was not statistically significant: R^2 = .00, $F(1, 43) = 3.51$, p = .07. More detailed results are presented in Table 39.

Table 35

Regression coefficient for acceptance strategy on PTG intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	30.40	[-8.75, 69.54]						
CA	2.95*	[0.43, 5.47]	.34	[0.05, 0.63]	.11	[.00, .30]	.34*	R^2 = .115* 95% CI[.00,.30]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* p < .05. ** p < .01. CA = CERQ: Acceptance strategy.

Table 36

Regression coefficient for positive reappraisal strategy on PTG intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	53.42**	[23.46, 83.37]						
CPRL	1.73	[-0.55, 4.01]	0.23	[-0.07, 0.53]	.05	[.00, .22]	.23	R^2 = .052 95% CI[.00,.22]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CPRL = CERQ: Positive Reappraisal strategy.

Table 37

Regression coefficient for positive refocusing on PTG intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	63.90**	[37.51, 90.28]						
CPRG	0.92	[-1.09, 2.93]	0.14	[-0.17, 0.44]	.02	[.00, .16]	.14	R^2 = .019 95% CI[.00,.16]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CPRG = CERQ: Positive Refocusing strategy.

Table 38

Regression coefficient for putting into perspective strategy on PTG intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	ssr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	67.53**	[35.70, 99.36]						
CPIP	0.63	[-1.86, 3.12]	0.08	[-0.23, 0.38]	.01	[.00, .12]	.08	R^2 = .006 95% CI[.00,.12]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$. CPIP = CERQ: Putting Into Perspective strategy.

Table 39

Regression coefficient for refocus on planning strategy on PTG intensity

Predictor	b	b 95% CI [LL, UL]	beta	beta 95% CI [LL, UL]	sr2	sr2 95% CI [LL, UL]	r	Fit
(Intercept)	41.80*	[4.82, 78.78]						
CROP	2.46	[-0.19, 5.11]	0.27	[-0.02, 0.57]	.08	[.00, .25]	.27	R^2 = .075 95% CI[.00,.25]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CROP = CERQ: Refocus on Planning strategy.

9.3.2 Linguistic meanigs as a predictors of PTG

9.3.2.1 H10 Positive reappraisal words' meanings are predictors of PTG

Simple linear regression was used to test whether the frequency of positive reappraisal words' meanings identified in interviews has significantly predicted PTG intensity. The overall regression was not statistically significant: R^2 = .003, $F(1, 44)$ =.14, p = 0.71. More detailed results are presented in Table 40.

9.3.2.2 H11 Acceptance words' meanings are predictors of PTG

Simple linear regression was used to test whether the acceptance words' meanings significantly predicted PTG intensity. The overall regression was not statistically significant: R^2= .01, $F(1, 44)$ =.53, p = .47. More detailed results are presented in Table 41. However, considering the low frequency of acceptance words' meanings in the narratives, the findings on **Acceptance** category should be treated with caution.

Table 40

Regression coefficient for positive reappraisal words' meaning on PTG intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	85.25**	[33.95, 136.55]						
Positive Reappraisal	-1.59	[-10.28, 7.09]	-0.06	[-0.36, 0.25]	.00	[.00, .10]	-.06	R^2 = .003 95% CI[.00,.10]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$.

Table 41

Regression coefficient for acceptance words' meanings on PTG intensity

Predictor	b	b 95% CI [LL, UL]	beta	beta 95% CI [LL, UL]	ssr^2	sr^2 95% CI [LL, UL]	r	Fit
(Intercept)	76.88**	[68.15, 85.61]						
Acceptance	-59.36	[-223.56, 104.84]	-0.11	[-0.41, 0.19]	.01	[.00, .14]	-.11	R^2 = .012 95% CI[.00,.14]

Note. b represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$.

9.3.3 Hierarchical regression analyses of PTG model

Hierarchical linear regression analysis was conducted to assess the prediction of PTG intensity using two categories of cognitive processing of trauma (PCPT and NCPT) in the first step. In the second step, linguistic categories **Acceptance** and **Positive Reappraisal** were also (simultaneously) entered to the model. The results of the first step revealed that positive and negative cognitive processing of trauma accounted for 19% of the variation in PTG intensity, and model was statistically significant ($p < .05$). However, 81% of the variation in PTG intensity could not be explained by the type of cognitive processing of trauma alone.

In the second step, the model was also statistically significant ($p < .05$), with the addition of **Acceptance** and **Positive Reappraisal** words' meaning categories accounting for 2% of the variation in PTG intensity, as indicated by the significant R^2 change value: $F(4, 40) = 2.7$. This means that 79% of the variation in PTG symptoms intensity could not be explained by the type of cognitive processing of trauma and linguistic categories in narrative alone. The detailed results of the analysis are presented in Table 42.

9.3.4 Summary

The analysis revealed that PCPT was a significant predictor of PTG, but only the acceptance strategy emerged as a significant PCPT substrategy. Linguistic categories did not show significant results. The general results section will provide a more detailed explanation of these findings.

Table 42

Hierarchical Regression Results for PTG intensity

Predictor	*B*	95% CI for *B* LL	95% CI for *B* UL	*SE B*	Beta	R^2	ΔR^2
Step 1						.19*	.19
Constant	-28.81	-96.97	39.36	33.78			
NCPT	0.98	.05	1.92	0.46	0.31		
PCPT	0.93	0.23	1.63	0.35	0.38		
Step 2						.21*	.02
Constant	-17.77	-96.31	60.77	38.86			
NCPT	1.12	0.14	2.11	.49	.34		
PCPT	0.93	0.22	1.64	.35	.38		
Acceptance	-56.78	-217.51	103.95	79.53	-.11		
Positive Reappraisal	-.2.72	-11.27	5.82	4.23	-.1		

Note. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.. NCPT = Negative Cognitive Processing of Trauma; PCPT = Positive Cognitive Processing of Trauma.

9.4 Qualitative Analyses of Strategies Appearing in the Text

Qualitative analyses did by raters were employed to determine whether and to what extent victims utilize various types of cognitive processing of trauma while talking about their traumatic event. NCPT was the cognitive emotion strategy type that was the most frequent (64.3%) (*M* = 6.26; *SD* = 6.81), whereas PCPT were less common (35.69%) (*M* = 4; *SD* = 4.2). Considering the individual categories, the most frequent were catastrophizing (32.1%) (*M* = 3.29; *SD* = 4.88), positive refocusing (15.6%) (*M* = 1.6; *SD* = 2.15) and rumination (13.2%) (*M* = -1.35; *SD* = 1.97), whereas the least applied strategies were positive reappraisal (6.6%) (*M* = -0.68; *SD* = 1.5) and acceptance (3.6%) (*M* = -0.37; *SD* = 0.86).

The results of study indicate that people use NCPT more often while describing a traumatic event, which can be associated with the tension triggered by the story about the

traumatic event. However, the obtained results show that PCPT strategies are also used. More detailed results are presented in Table 43 and 44.

Table 43

Example of each cognitive emotion regulation strategy in the corpora chosen by the rater

Strategy	Example
Self-blame	I still feel a sense of guilt for myself that I have brought myself to such a state that I had to ask the stranger for help.
Blaming others	Now, in retrospect, I have a bit of a feeling that it was his fault.
Rumination	I really don't know. And it doesn't give me peace. It gives me such a hard time. I can't find a place for myself.
Catastrophizing	Well, and suddenly it was as if everything stood on its head. There is nothing. There is no, there is no future, as it were. No one knows what will happen next.
Acceptance	I thought that maybe, maybe it was meant to be like this, maybe it is some kind of destiny as some kind of
Refocus on planning	Then my sister and I started wondering how we were going to get to our house, which we were going to, and we started calling friends who lived near our house.
Positive refocusing	The doctor said that she had a friend of hers there, such a good, cool doctor who works there. And that was such a positive aspect for me at the time.
Positive reappraisal	Well, and after this whole event I returned to playing bass. And I am now a bass player in the band, which is great.

Putting into perspective	I've had more than one situation in my life that needed to be dealt with.

Table 44

Frequency of each general and single cognitive emotion regulation strategy identified in interviews

Cognitive emotion regulation strategy	N	Percentage
Negative cognitive processing of trauma	**388**	**64.3**
Self-blame	50	7.9
Blaming others	50	7.9
Rumination	84	13.2
Catastrophizing	204	32.1
Positive cognitive processing of trauma	248	35,69
Acceptance	23	3.6
Refocus on planning	63	9.9
Positive refocusing	99	15.6
Positive reappraisal	42	6.6
Putting into perspective	21	3.3

In this qualitative study, raters additionally marked sentence in which the subcategory words' meaning *Insight* and *Causation* (See Table 2) appeared. Result revelead that participants used mostly *Causation* subcategory (91.3%) (M = 4,4; SD = 3,77), whereas *Insight* subcategory

was used rarely (8.7%) (*M* = 0.42; *SD* = .86). These results shows that *Causation* is far more important subcategory than *Insight* within the **Positive Reappraisal** (see table 45).

Table 45

Frequency of Positive Reappraisal category with subcategory of Insight and Causation in the corpora

Category	N	Percentage
Positive reappraisal	300	100%
Insight	26	8.7%
Causation	274	91.3%

9.5 Summary

In the longitudinal study, the central aim was answering the theory-derived expectations concerning the relationships between the type of cognitive processing of trauma (PCPT and NCPT) and the aftermath of trauma (PTSD, PTG and PTD).

In the hierarchical model of PTSD the two types of cognitive processing of trauma were entered in the first step and two linguistic categories (**Exaggeration** and **Blame**) were added in the second step. Although the results were consistent with the expectations, the model was not statistically significant. However, the results of linear regression analyses revealed the NCPT was the only variable that had a significant impact on predicting the development of PTSD. It explained 9.2% of the variance in the explanatory variable. These results suggest that the NCPT may be a more important factor to consider when assessing and predicting PTSD in individuals compared to the PCPT.

In the hierarchical model of PTD, two types of cognitive processing of trauma were entered in the first step and the linguistic categories were added in the second step. This model was statistically significant and confirmed that NCPT is a predictor of PTD, whereas PCPT is a protective factor (i.e. negative predictor). Adding exaggeration to the model increased its

explanatory value. The outcomes of the hierarchical regression analysis were corroborated by the findings from the simple linear regression analyses, which identified catastrophizing, rumination, and self-blame as significant predictors of PTD.

In the hierarchical model of PTG, two types of cognitive processing of trauma were entered in the first step and the linguistic categories were added in the second step. This model was statistically significant and confirmed that both PCPT and NCPT predicted PTG. Completing this model with **Positive Reappraisal** and **Acceptance** category increased the percentage of variation explained in the model.

Overal, the results of regression analyses revealed that PCPT is a predictor of PTG and negative predictor of PTD, whereas NCPT was a predictor of both PTSD and PTD.

These results are promising in light of past findings that divided cognitive emotion regulation strategies as maladaptive or adaptive. PCPT contains adaptive strategies that use cognitive processes that foster positive changes accompanying traumatic events and are protective factor against cognitive changes such as PTD.

The results from the qualitative analysis of interviews showed that survivors uses more negative cognitive processing of trauma, particularly rumination and catastrophizing which is consistent with the results from quantitative analysis. On the other hand, the most often used cognitive emotion regulation strategy is positive refocusing which in quantitative research has no positive relationship with any of trauma's aftermath.

Overall, study 1 revealed a few weakness in the instructions, as a consequence of which participants only talked about the causes and progress of the traumatic event, which may have limited their ability to express their thoughts about the event's meaning. Consequently, the narratives may ave not provided sufficient exposure to the frequency of certain types of words'

meanings. Lack of the results from linguistic categories and interviews shorter than those found in analogous corpora revealed the need for a second study. The primary investigator assumed that additional questions should be asked to capture the linguistic indicators of the cognitive processing of trauma. Second, the heterogeneity of traumatic experiences was also considered to be a factor that may influence the difficulties of generalizing the study findings.

STUDY 2

Chapter 10 Overview

The lexical analyses of interviews collected in the first study revealed that the interview quality was not adequate, as the interviews were too short. Therefore, the researcher decided to conduct a second study. The second study was improved in two ways by (a) extending the interview instructions with questions about coping strategies and the psychological effects of the event and (b) all potential participants were required to survive a car accident. Individuals who did not meet this criterion were excluded from the study.

The second study should answer the following questions:

1. Which type of cognitive processing of trauma is a predictor of posttraumatic stress disorder (PTSD)?

2. Which words' meanings in the narrative content predict posttraumatic stress disorder (PTSD)?

3. How accurate is the algorithm dedicated to recognizing the categories for word `meanings?

Based on the literature review, the following hypotheses were proposed:

H1. Negative cognitive processing of trauma (NCPT) is a predictor of PTSD.

H2. Positive cognitive processing of trauma (PCPT) is a negative predictor of PTSD.

H3. Blaming words' meanings are predictors of PTSD.

H4. Exaggeration words' meanings are predictors of PTSD.

Chapter 11 Method

11.1 Participants

Participants included 29 women and 21 men aged from 19 to 67 years (M = 27.02, SD = 9.07) who participated in the car accident within last 6 months.

11.2 Procedure

Interviews were conducted in the research lab by the trained psychologist. After the interview participants were asked to fill the questionnaires. Prior to the interviews, participants were given informed consent documents and had the opportunity to ask any questions they had about the study. The interviewer did not disrupt the interviewee with any additional questions. Interviewer asked additional questions about accident's reason, type of coping styles and consequences if interviewee did not include it in the first narrative. The interviews were recorded and transcribed for later analysis.

11.3 Materials and methods

Interview

Researcher asked trauma's survivor to answer the following questions:

> I would like to ask you to tell me about a traffic accident in which you were involved. Please tell me when this accident took place. In addition, I ask you to tell me how the accident happened, the course of the accident, and who was involved in it. Even if the recollection is unpleasant, I would appreciate your attempt to be as detailed and as honest as you can. In your story, you may include information about how you felt mentally and physically immediately after the accident. I would also like you to include in your story what thoughts accompanied you after the accident. What did

you think about its causes, course and consequences?

Then focus on the mental consequences of the event, both short-term and long-term. (What are the mental consequences of the event, both short-term and long-term?) These may include changes in the way you view yourself, loved ones, other people, and life. You may have begun to look at certain areas in your life differently, such as your health, your relationships with others, or your surroundings. An extreme stressful event causes a great deal of tension in a person. Each of us manages stress differently. Finally, please tell us how you dealt with the difficult emotions that were triggered by the incident. I will not interrupt you or ask additional questions. It is important that this is your story. It will last about half an hour. Can we get started?

Interview for PTSD symptom severity

The intensity of PTSD symptoms was assessed in the second stage of the study using the Structured Clinical Interview (SCID-I) module F (First, 2004) in Polish adaptation by Popiel et al. (2010) covering all the DSM-IV diagnostic criteria for PTSD. Answers are given on 3-point scale (1 = *false* to 3 = *true*). The interviews were conducted by qualified diagnostics - psychiatrists or psychotherapists. The Structured Clinical Interview for DSM-IV (SCID) was utilized to verify the presence of post-traumatic stress disorder (PTSD) in the respondent. For the purposes of analysis, the answers of the final PTSD symptomps severity were recoded to quantify the intensity of symptoms. Each symptom that the respondent confirmed was assigned a value of 1 if present, resulting in a total possible score of 17.

Questionnaire for Symptoms of Anxiety and Depression

Hospital Anxiety Depression Scale shows the presence and severity of anxiety and depression symptoms in the past week (Snaith & Zigmond, 2000) in Polish adaptation by Majkowicz et al. (2000). Questionnaire consists of 14 items divided into 2 subscales: HADS-A related to the anxiety and HADS related to the depression, 7 items each. Score for each item is from 1 to 4.

Questionnaire for Intrusive and Deliberate Rumination

Assessing of the two types of rumination's escalation is measured by the Event Related Rumination Inventory – ERRI (Cann et al., 2011) in Polish translation by Zięba (Taku et al., 2021). The inventory consists of two subscales which measure the extent of intrusive and the deliberate rumination. Each subscale consists of 10 items. Answers are given on 5-point scale (1 = *not at all* to 5 = *very often*).

Questionnaire for Type of Cognitive Processing of Trauma

A type of cognitive emotion regulation is measure by the 18-item version of the Cognitive Emotion Regulation Questionnaire prepared by Garnefski (Garnefski & Kraaij, 2007) in Polish translation by Marszał-Wiśniewska and Fajkowska (Marszał-Wiśniewska & Fajkowska, 2010). Questionnaire consists of 36 items divided into 9 subscales: *self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, blaming others* . Responses can be given using 5-point scale (1 = *hardly never* to 5 = *always*).

Garnefski showed that cognitive emotion regulation can be grouped into adaptive and non-adaptive regulation strategies. Each strategy is an indicator of negative or positive cognitive processing of trauma.

Negative cognitive processing of trauma is connected with the following cognitive coping strategies: *catastrophizing, self-blame, blaming others, rumination*.

Positive cognitive processing of trauma is associated with the following cognitive emotion regulation strategies: *acceptance, refocus on planning, positive refocusing, positive reappraisal, putting into perspective*

11.4 Quantitative Analysis of Linguistic Meanings in the Interviews

Similarly to previous research, interviews were recorded, transcribed and cleaned according to the protocol described in the method of creating words' meaning categories (see Chapter 5).

Narrative's corpus was analyzed with the LEM tool to obtain frequency distribution of words' meaning categories used in previous study: **Positive Reappraisal** (with *Insight* and *Causation* subcategories), **Blaming**, **Acceptance** and **Exaggeration**.

11.5 Words' Meanings Frequency Analyses

Acquired corpora consisted of 76859 tokens (M = 1537 SD = 1012), with the shorter transcription containing 451 tokens and the longest transcription 4878 tokens. The results of the analysis showed that word frequencies identified in the interviews were as follows: the **Acceptance** category, M = .02% SD = .06%; the **Blaming** category, M =.04%, SD = .07%; the *Causation* subcategory, M = 4.69%, SD = 1.28% *Insight* subcategory, M = 1%, SD =.43% and **Exaggeration** category, M = .39%, SD = .27%.

Chapter 12 Results

Similar to the first study, results of analysis are divided in two sections: the types of cognitive processing of trauma as PTSD preditors (chapter 13.1.1) and linguistic categories containing words' meanings as PTSD predictors (chapter 13.1.2). In addition to these two

chapters a hierarchical regression for all four hypothesized predictors is reported. At the end of this chapter the categorization compatibility between the computer algorithm and competent judges is reported (chapter 13.2)

12.1 PTSD Predictors

First, I calculated descriptive statistics and correlations between all variables and PTSD symptoms intensity as presented in Table 46.

Table 46

Descriptive statistics and correlations for Study 2

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. PTSD	4.22	4.14										
2. IR	33.82	9.04	.53**									
3. DR	29.62	8.96	.36*	.54**								
4. PCPT	66.32	13.38	-.28*	-.16	.35*							
5. NCPT	45.40	8.79	.55**	.74**	.35*	-.25						
6. Anxiety (HADS_A)	16.88	4.99	.77**	.66**	.49**	-.17	.67**					
7. Depression (HADS_D)	13.64	4.40	.61**	.52**	.34*	-.28*	.47**	.73**				
8. Acceptance	0.02	0.06	-.19	-.01	-.03	-.01	-.26	-.19	-.15			
9. Blaming	0.04	0.07	.13	.15	.07	-.13	.17	.13	.20	-.01		
10. Exaggeration	0.40	0.27	-.15	-.04	-.18	.03	-.18	-.15	-.03	.32*	-.06	
11. Positive_Reappraisal	5.68	1.33	.07	.16	.27	.14	.04	.00	-.22	-.04	.01	-.24

Note. M and SD are used to represent mean and standard deviation, respectively. * $p < .05$. ** $p < .01$. PTSD = Posttraumatic stress disorder; IR = Intrusive ruminations; DR = Deliberative ruminations; PCPT = Positive Cognitive Processing of Trauma; NCPT = Negative Cognitive Processing of Trauma.

12.1.1 Type of cognitive processing of trauma as a predictor

12.1.1.1 H1 Negative cognitive processing of trauma is a predictor of posttraumatic stress disorder symptoms intensity (PTSD)

Negative cognitive processing of trauma as a predictor of PTSD

Linear regression analysis with the NCPT as a predictor and PTSD symptoms as the explanatory variable revealed a strong relationship between the PTSD symptom intensity and NCPT: $\beta = .55$, $p < .01$. The proposed model was well fitted to the data: $F(1, 48) = 20.40$, $p < .01$.

It can be concluded that individuals who applied negative processing of trauma strategies experienced more intense PTSD symptoms. The tested model explains 29.8 % of the variance in the outcome variable. More detailed results are presented in Table 47 and Graph 7.

Table 47

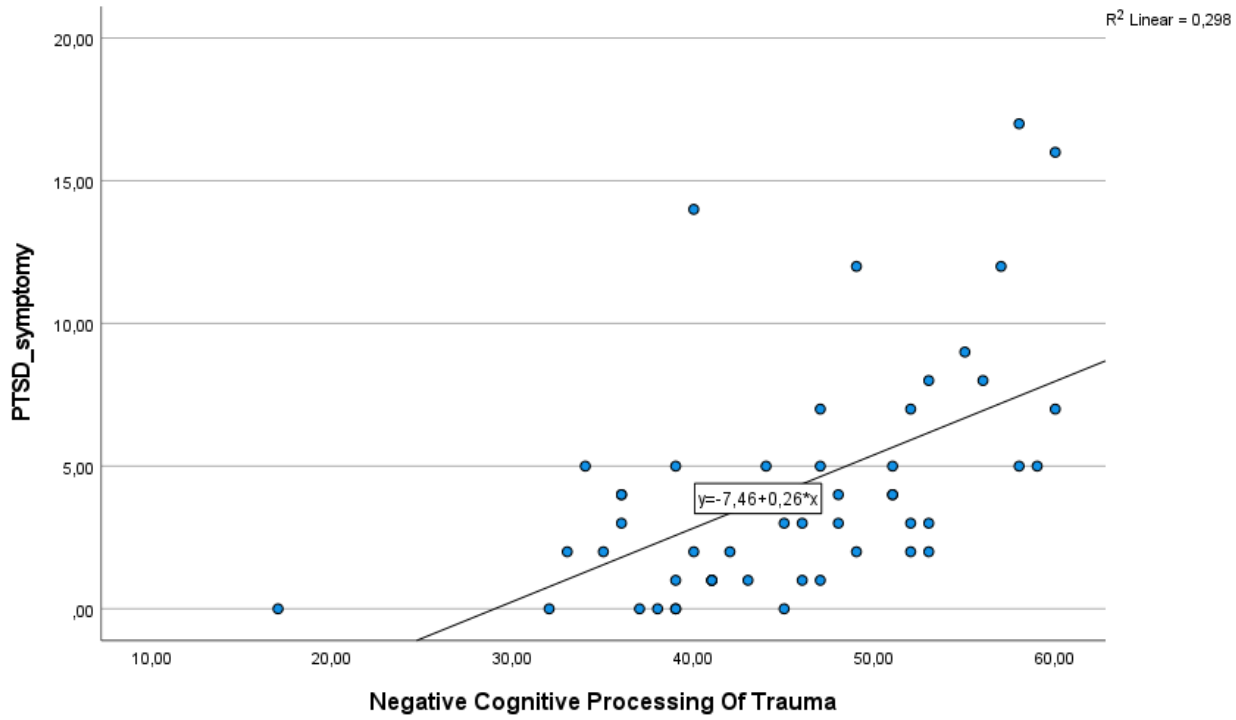
Regression coefficient for NCPT on PTSD symptoms intensity

Predictor	*b*	95% CI [LL, UL]	*beta*	95% CI [LL, UL]	sr^2	sr^2 90% CI [LL, UL]	*r*	Fit
(Intercept)	7.46**	[-12.75, -2.16]						
NCPT	.26**	[0.14, 0.37]	0.55	[0.30, 0.79]	.30	[.13, .44]	.55**	R^2 = .298** 90% CI[.13,.44]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$. NCPT = Negative Cognitive Processing of Trauma.

Graph 7

NCPT as a predictor of PTSD symptoms intensity



In addition to the analyses reported above, I also performed analyses where PTSD symptoms intensity were tested to be predicted by single negative cognitive emotion regulation strategies as assessed with CERQ, i.e. catastrophizing, rumination, self-blame and blaming others. These analyses were carried out as simple linear regressions with the single cognitive emotion regulation strategies as predictors.

Catastrophizing strategy as a predictor of PTSD

Linear regression analysis with the catastrophizing strategy revealed that the proposed model was found to be well fitted to the data, with: $F(1, 48) = 17.78$, $p < .01$. Based on the regression coefficients, it can be concluded that the PTSD intensity is strongly related with the catastrophizing strategy: $\beta = 0.52$, $p < .01$.

Individuals who applied the catastrophizing strategy experienced higher levels of PTSD. The tested model accounts for 27% of the variance in the outcome variable. See Table 48 for detailed results.

Rumination strategy as a predictor of PTSD

Linear regression analysis with the rumination strategy showed that proposed model was found to be well fitted to the data, with: $F(1, 48) = 11.56$, $p < .01$. Based on the regression coefficients, it can be concluded that the PTSD intensity is moderately related with the rumination strategy: $\beta = .44$, $p < .05$.

Individuals who applied rumination strategy experienced higher level of PTSD. The tested model accounts for 19.4% of the variance in the outcome variable. See Table 49 for detailed results.

Self-blame strategy as a predictor of PTSD

Linear regression analysis with the self-blame strategy showed that proposed model was found to be well fitted to the data, with: $F(1, 48) = 4.83$, $p <. 05$. Based on the regression coefficients, it can be concluded that the PTSD intensity is moderately related with the self-blame: $\beta = .30$, $p < .05$.

Individuals who applied self-blame strategy experienced higher level of PTSD. The tested model accounts for 9.1% of the variance in the outcome variable. See Table 50 for detailed results.

Blaming others strategy as a predictor of posttraumatic depreciation

Linear regression analysis was used to test whether the other blame strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .03$, $F(1, 48) = 1,60$, $p = .21$. See Table 51 for detailed results.

Table 48

Regression coefficient for catastrophizing strategy on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	-2.61	[-6.02, 0.80]						
CC	0.71**	[0.37, 1.05]	0.52	[0.27, 0.77]	.27	[.08, .45]	.52**	R^2 = .270** 95% CI[.08,.45]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CC = CERQ: Catastrophizing strategy.

Table 49

Regression coefficient for rumination strategy on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	-2.80	[-7.09, 1.48]						
CR	0.51**	[0.21, 0.82]	0.44	[0.18, 0.70]	.19	[.03, .37]	.44**	R^2 = .194** 95% CI[.03,.37]

Note. *b* represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CR = CERQ: Rumination strategy.

Table 50

Regression coefficient for self-blame strategy on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	0.29	[-3.47, 4.06]						
CSB	0.35*	[0.03, 0.67]	0.30	[0.03, 0.58]	.09	[.00, .26]	.30*	R^2 = .091* 95% CI[.00,.26]

Note. *b* represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CSB = CERQ: Self-blame strategy.

Table 51

Regression coefficient for blaming others strategy on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	1.71	[-2.44, 5.87]						
CBO	0.23	[-0.14, 0.59]	0.18	[-0.11, 0.47]	.03	[.00, .17]	.18	R^2 = .032 95% CI[.00,.17]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CBO = CERQ: Blaming Others strategy.

12.1.1.2 H2 Positive cognitive processing of trauma is a negative predictor of posttraumatic stress disorder (PTSD).

Positive cognitive processing of trauma as a negative predictor of PTSD

Linear regression analysis was performed with the PCPT as the predictor and PTSD symptoms as the outcome variable. The proposed model was found to be well fitted to the data, with: $F(1, 48) = 4.20$, $p < .05$. Based on the regression coefficients, there is weak relationship between PTSD symptom intensity and positive cognitive processing of trauma: $\beta = -28$; $p < .05$.

This indicates that individuals who applied PCPT strategies experienced less intense PTSD symptoms. The tested model accounts for 8% of the variance in the outcome variable. More detailed results can be found in Table 52 and Graph 8.

Table 52

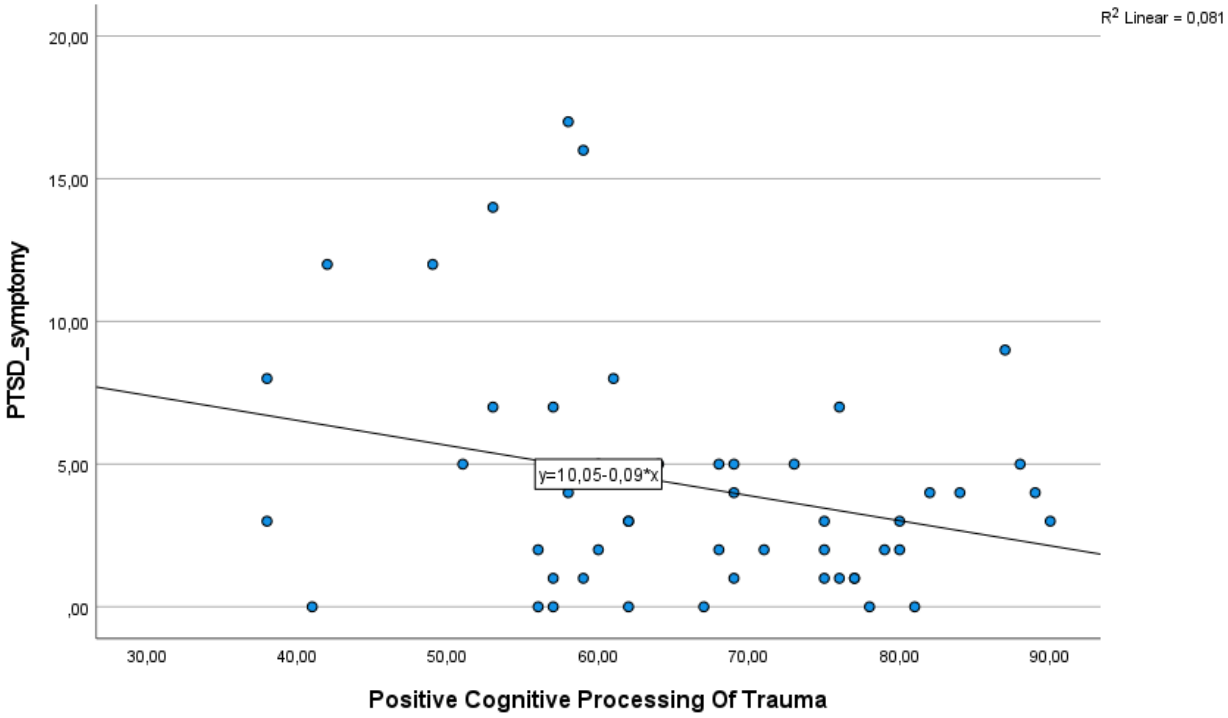
Regression coefficient for PCPT on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	10.05**	[4.23, 15.87]						
PCPT	-0.09*	[-0.17, -0.00]	-0.28	[-0.56, -0.01]	.08	[.00, .25]	-.28*	R^2 = .081* 95% CI[.00,.25]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* indicates $p < .05$. ** indicates $p < .01$. PCPT = Positive Cognitive Processing of Trauma.

Graph 8

PCPT as a predictor of PTSD symptoms intensity



Further analysis were conducted in which PTSD symptoms intensity were tested to be predicted by single positive cognitive emotion regulation strategies as assessed with CERQ, i.e. refocus on planning, positive refocusing, positive reappraisal, putting into perspective and acceptance. These analyses were carried out as simple linear regressions with the single cognitive emotion regulation strategies as predictors to identify which single cognitive emotion regulation strategies, included within the positive cognitive processing of trauma, are the strongest predictors of PTSD symptom intensity.

Refocus on planning strategy as a predictor of posttraumatic stress disorder

Linear regression analysis with the refocus on planning strategy as the predictor demonstrated that the proposed model was found to be well fitted to the data, with: $F(1, 48)$ =

4.08, $p < .05$. Based on the regression coefficient, it can be concluded that the intensity of PTSD is significantly related to the refocus on planning, with: $\beta = -0.28$, $p < .05$.

Individuals who applied the refocus on planning strategy experienced lower levels of PTSD. The tested model accounts for 7.8% of the variance in the outcome variable. See Table 53 for detailed results.

Positive refocusing strategy as a predictor of posttraumatic stress disorder.

Linear regression analysis was conducted to test whether the positive refocusing strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .06$, $F(1, 48) = 2.85$, $p = .099$. See Table 54 for detailed results.

Positive reappraisal on planning strategy as a predictor of posttraumatic stress disorder.

Linear regression analysis was conducted to test whether the positive reappraisal strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .05$, $F(1, 48) = 2.72$, $p = .106$. See Table 55 for the detailed results.

Putting into perspective strategy as a predictor of posttraumatic stress disorder.

Linear regression analysis was conducted to test whether putting into perspective strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .15$, $F(1, 48) = 1.07$, $p = .31$. See Table 56 for the detailed results.

Acceptance strategy as a predictor of posttraumatic stress disorder.

Linear regression analysis was conducted to test whether the acceptance strategy significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .02$, $F\ (1, 48) = 1.27$, $p = .27$. See Table 57 for the detailed results.

Table 53

Regression coefficient for refocus on planning strategy on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	9.14**	[4.11, 14.17]						
CROP	-0.35*	[-0.70, -0.00]	-0.28	[-0.56, 0.00]	.08	[.00, .24]	-.28*	R^2 = .078* 95% CI[.00,.24]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$. CROP = CERQ: Refocus on Planning strategy.

Table 54

Regression coefficient for positive refocusing strategy on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	7.26**	[3.46, 11.07]						
CPRG	-0.26	[-0.58, 0.05]	-0.24	[-0.52, 0.05]	.06	[.00, .21]	-.24	R^2 = .056 95% CI[.00,.21]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CPRG = CERQ: Positive Refocusing strategy.

Table 55

Regression coefficient for positive reappraisal strategy on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	7.14**	[3.40, 10.88]						
CPRL	-0.23	[-0.51, 0.05]	-0.23	[-0.51, 0.05]	.05	[.00, .21]	-.23	R^2 = .054 95% CI[.00,.21]

Note. *b* represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CPRL = CERQ: Positive Reappraisal strategy.

Table 56

Regression coefficient for putting into perspective on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	6.53**	[1.88, 11.19]						
CPIP	-0.17	[-0.49, 0.16]	-0.15	[-0.43, 0.14]	.02	[.00, .15]	-.15	R^2 = .022 95% CI[.00,.15]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CPIP = CERQ: Putting into Perspective strategy.

Table 57

Regression coefficient for acceptance strategy on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	7.27*	[1.69, 12.85]						
CA	-0.22	[-0.60, 0.17]	-0.16	[-0.45, 0.13]	.03	[.00, .16]	-.16	R^2 = .026 95% CI[.00,.16]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* p < .05. ** p < .01. CA = CERQ: Acceptance strategy.

12.1.2 Linguistic meanigs as a predictor

12.1.2.1 H3 Blaming words' meanings are predictors of posttraumatic stress disorder

Simple linear regression was used to test whether blaming words' meanings significantly predicted PTSD intensity. The overall regression was not statistically significant: R^2= .02, $F(1,48) = .82$, p =.37. See Table 58 for the detailed results.

12.1.2.2 H4 Exaggeration words' meanings are predictors of posttraumatic stress disorder

Simple linear regression was used to test whether exaggeration words' meanings significantly predicted PTSD intensity. The overall regression was not statistically significant: $R^2 = .02$, $F(1, 48) = 1.05$, $p = .31$. See Table 59 for the detailed results.

Table 58

Regression coefficient for blaming words' meanings on PTSD symptoms intensity

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95%CI [LL, UL]	*r*	Fit
(Intercept)	3.93**	[2.59, 5.27]						
Blaming	8.05	[-9.83, 25.93]	0.13	[-0.16, 0.42]	.02	[.00, .14]	.13	R^2 = .017 95% CI[.00,.14]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$.

Table 59

Regression coefficient for exaggeration words' meanings on PTSD symptoms intensity

Predictor	b	b 95% CI [LL, UL]	beta	beta 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	r	Fit
(Intercept)	5.10**	[3.01, 7.20]						
Exaggeration	-2.22	[-6.59, 2.14]	-0.15	[-0.43, 0.14]	.02	[.00, .15]	-.15	R^2 = .021
								95% CI[.00,.15]

Note. b represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.* $p < .05$. ** $p < .01$..

12.1.3 Hierarchical regression analyses of PTSD model

To answer which type of cognitive processing of trauma is a predictor of PTSD, hierarchical linear regression analysis was conducted including following predictors: positive cognitive processing of trauma, negative cognitive processing of trauma, exaggeration words' meanings and blaming words' meanings.

In the first step, PCPT and NCPT were entered to verify its impact on PTSD intensity. In the second step, linguistic categories **Blaming** and **Exaggeration** were entered simultaneously.

The results of the first step of the analysis revealed a model to be statistically significant ($p < .001$). Additionally, the R^2 value of .32 associated with this regression model suggested that PCPT and NCPT accounted for 32% of the variation in PTSD symptoms intensity, which means that 68 % cannot be explained by the type of cognitive processing of trauma alone.

The results of the second step of the analysis revealed that this model was also statistically significant ($p < .01$). The R^2 change value $F(4,45) = 5.4$; $p < .01$ was statistically significant.

The addition of exaggeration and blaming meanings to the first block model explained 0.3% of the variation in PTSD symptom intensity, which means that 67.7% of the variation in PTSD symptoms intensity could not be explained by the type of cognitive processing of trauma and the linguistic words' meanings in narrative alone. More detailed results are presented in Table 60.

Table 60
Hierarchical Regression Results for PTSD intensity

Predictor	*B*	95% CI for *B*		*SE B*	Beta	R^2	ΔR^2
		LL	UL				
Step 1	-3.41	-11.76	4.93	4.15		0.32**	0.32
Constant							
NCPT	0.24	0.12	0.36	0.06	0.51		
PCPT	-0.05	-0.13	.03	0.04	-1.6		
Step 2						0.32**	0.003
Constant	-2.92	-11.82	5.98	4.42			
NCPT	0.23	-0.11	0.36	0.06	0.49		
PCPT	-0.05	-0.13	0.03	0.04	-0.15		
Exaggeration	-0.78	-4.6	3.04	1.90	-0.05		
Blaming	1.48	-14.15	17.11	7.76	0.24		

Note. *B* represents unstandardized regression weights. *Beta* indicates the standardized regression weights. Sr^2 represents the semi-partial correlation squared. *R* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * p < .05. ** p < .01. Negative Cognitive Processing of Trauma; PCPT = Positive Cognitive Processing of Trauma.

12.2 Compatibility of Recognized Words'Meanings by the Algorithm and the Raters

The second study sought to determine if lexical meanings identified by the computer were appropriately recognized text. To realize this aim a pair of raters evaluated 16 sentences from the **Acceptance** category, 23 sentences from the **Blaming** category, 785 sentences from the *Insight* subcategory, and 140 sentences from the **Exaggeration** category. The kappa coefficients, which measured inter-rater reliability, ranged from .61 to 1 between the two raters. The compatibility between the meanings recognized by the algorithm and the raters ranged from 27.9% to 95.7%. 62% of words' meanings were positively verified as accurately identified by the computer algorithm, while 38% were incorrectly recognized. These findings suggest that the categorization accuracy of the algorithm is insufficient. See Table 61 for more details.

Table 61

Meaning recognition compatibility between raters and between the algorithm and raters

Category	Kappa reliability between raters	Raters agreed on one meaning		Compatibility between raters and the algorithm	
		N	%	N	%
Acceptance	.65	13	81.2	9	56.3
Blaming	1	23	100	22	95.7
Exaggeration	.61	95	67.9	39	27.9
Insight	.72	677	86.2	561	71.5

12.3 Summary

The purpose of this study was to replicate the results of the study 1 about impact of NCPT and PCPT on the trauma's outcome. The second goal was to verifiy of the algorithm's accuracy in categorisation of linguistic meanings by comparing the ratings made the algorithm with those performed by in the text evaluated by human raters.

The present results are consistent with the first study that NCPT is a predictor of PTSD. Relationship in study 2 (β = .55), is stronger that in the study I: β =.30. The difference may result from differences in recrutation criteria between study 1 and study 2 – the sample investigated in study 2 was much more homogenous when compared to study 1. Additionally, rumination and catastrophizing, which are two separate negative emotional cognitive strategies, were determined as significant predictors of PTSD in this study and the self-blame strategy was third (newly discovered) significant contributing factor.

In the hierarchical model of PTSD, negative and positive cognitive processing of trauma were entered in the first step and two linguistic categories (Exaggeration and Blame) in the second step. This model was statistically significant and confirmed that negative cognitive processing of trauma is a predictor of PTSD. However, hierarchical regression showed that either the PCPT

nor the two linguistic categories were significant predictors of PTSD. Although, a weak relationship between PTSD symptom intensity and positive cognitive processing of trauma was found with refocusing on planning as the only significant predictor of PTSD. This latter result shows that some aspects of PCPT may play a role as a negative predictor of PTSD symptoms intensity.

The second aim of study 2 was to search for linguistic categories predicting the PTSD symptoms. There are at least three key findings of the present research. First, the accurateness of algorithm recognizing words' meanings was not satisfactory in each category. Although, compatibility between raters and the algorithm differed between categories. They were more compatible for **Blaming** category and *Insight* subcategory that contain more precise words, such as: "blame," or "think" which indicated specific psychological mechanisms, but were less compatible for the two other categories, probably caused by the similarity of meanings in plWordnet.

Secondly, the narratives showed relatively low frequencies of **Acceptance** and **Blaming** categories, which discriminates these categories as useful in predicting PTSD. Third, the results from the study 2 confirm that even the relatively frequent words' meanings categories are not the significant predictors of PTSD.

PART III

DISCUSSION OF RESEARCH RESULTS

Chapter 13 Discussion

The presented thesis reports two separate studies conducted to answer the question if different types of cognitive processing of trauma predict different types of readaptation to traumatic life events, i.e., posttraumatic stress disorder (PTSD), posttraumatic growth (PTG) and posttraumatic depreciation (PTD). Building upon Garnefski's (2001) classification that differentiates adaptive and non-adaptive cognitive emotion regulation strategies, the cognitive processing of trauma, which involves the reintegration of cognitive schemas, has been separated into two contrasting processes: positive and negative. Cognitive emotion regulation strategies were assessed with CERQ questionnaire, whereas posttraumatic readaptations were assessed with the PTGDI-X questionnaire and SCID-I interview.

Based on the transcripts from the interviews, I also investigated whether there are any specific linguistic markers present in the description of traumatic events that could serve as predictors of posttraumatic readaptation. This chapter will discuss the findings of two studies, along with their potential implications for both future research and practical applications.

13.1 The Effects of Positive Cognitive Processing of Trauma

The results of Study 1 did not support the hypothesis that PCPT is a negative predictor of PTSD. Furthermore, none of the individual cognitive emotion regulation strategies was a significant predictor of PTSD, although many studies in the literature have confirmed the positive relationship between PTSD symptoms severity and individual PCPT strategies, such as positive refocusing (Lee et al., 2000; Kaczkurin et al., 2017), positive reappraisal (Liu et al., 2019), and putting into perspective (Puechlong, 2020). The conclusions of Study 2

contradicted those of Study 1, but confirmed the hypothesis that PCPT is a negative predictor of PTSD. However, analyses for the specific strategies revealed that the level of PTSD was significantly reduced only in those individuals who applied the refocus on planning strategy. The inconsistency between the results of Study 1 and Study 2 can be explained, in part, by differences in group characteristics between the two studies, as the type of traumatic events that was set as an inclusion criterion differed between the two studies, which could have influenced the development of PTSD (Birkeland, 2021; Hartley et al., 2013). Another possible explanation could lie in the differences in the procedure for assessing PTSD symptoms in the two studies. In Study 1, PTSD level was examinedat a 6-month follow-up after the measurement of posttraumatic cognitive processing. In contrast, Study 2 used a cross-sectional design to simultaneously measure PTSD levels and type of posttraumatic cognitive processing.

Upon further examination, it was discovered that PCPT in Study 1 could predict PTG. Previous studies indicated that specific cognitive emotion regulation strategies, such as positive refocusing, positive reappraisal, and putting into perspective, could explain a substantial amount of variance in PTG (Garnefski et al., 2008; Hanley et al., 2017; Łosiak & Nikiel, 2014). However, contrary to these results, only the acceptance strategy was found to be significant in explaining 11% of the variance in PTG in the present study. This finding suggests that the acceptance strategy not only supports individuals avoiding the emotional pain caused by traumatic events (Wolgast, 2013), but also contributes to the positive transformation of cognitive patterns that were disrupted during the event.

Regarding the relationship between the PCPT and PTD, which has not, so far, been investigated, the present studies did not confirm my hypothesis that PCPT would be a significant

predictor of PTD. However, there was a negative correlation between positive refocusing and PTD, which indicated that this strategy reduced the risk of PTD.

These findings are consistent with the cognitive model of PTSD developed by Ehlers and Clark (2000), which suggested that negative appraisals of the traumatic event lead survivors to the experience of threat. The research by Brown et al. (2019) revealed that focusing on the positive aspects of the traumatic event can serve as a protective factor against negative cognitions and potentially avert the emergence of PTD.

The results of the qualitative analysis (Study 1) highlighted the fact that trauma survivors use several types of cognitive emotion regulation strategy while describing the traumatic event. Surprisingly, 35.7% of all noticed strategies were those included in PCPT. Together with the previous quantitative findings, these results show that the type of posttraumatic cognitive processing of trauma can be identified during the interview with the trauma survivor. This conclusion can be important for crisis interveners and psychologists who can adjust their interventions, so that the risk of PTSD or PTD can be reduced. What is more, the acceptance strategy, which was a predictor of PTG, was found to have the lowest frequency in the collected narrative data (3.6%), which indicates that it may be a difficult strategy to detect. This finding is consistent with the results of the quantitative analysis which showed that the words' meanings indicating **Acceptance** are rarely used (M = .02% frequency in the narratives in Study 1 and Study 2). It is, however, possible that the structure of the interview, which did not emphasize positive changes, may have contributed to this finding.

Qualitative analysis showed that a refocus on planning (a negative predictor of PTSD) was often used by trauma survivors (9.9%), as was positive refocusing (15.6%), which allows me to draw the conclusion that these coping mechanisms are activated when creating a narrative

about the traumatic event, as in theory put forward by Pennebaker (1986). He postulated that process of coping with trauma entails the verbal expression of emotions, which facilitates the assimilation of the traumatic experience. These results are also aligned with the observations of Tuval-Mashiach et al. (2004), who noticed that the act of constructing a narrative can serve as a coping mechanism and potentially be utilized as an intervention tool. By creating a trauma story through the use of information, reconstruction or cognitive processing, individuals can assign personal significance to the event and contextualize it within their broader life experience, rather than allowing it to remain the focal point

13.2 The Effects of Negative Cognitive Processing of Trauma

The results of the Study 1 support the hypothesis that NCPT is a predictor of PTSD. The existing literature provides substantial evidence supporting a positive relationship between various NCPT strategies and PTSD, including catastrophizing (Kaczkurin, 2017; Garnefski, 2007; Green, 2018), self-blame (Dillon et al., 2020; Ouhmad, 2022), rumination (Jennes et al., 2016; Moulds et al., 2020) and blaming others (Szentágotai-Tătar & Miu, 2016). However, the findings from Study 1 only partially confirmed those in the literature, as none of the blaming strategies were found to be a significant predictor of PTSD on their own.

Study 2 strengthened the results of Study 1 in showing that NCPT is a predictor of PTSD. The results regarding single cognitive emotion regulation strategies were, however, only partially consistent between the two studies. Specifically, self-blame emerged as a significant PTSD predictor in Study 2, whereas blaming others was not found to be a significant predictor of PTSD (as in Study 1). The different roles for self-blaming and blaming others as predictors of PTSD can be explained by the existing literature (e.g. Zinzow et al., 2010): blaming others has been shown to have a self-protective function and reduces the need to create negative cognitions about

oneself, whereas the self-blame strategy seems to induce and maintain PTSD symptoms (LoSavio et al.,2017) by supporting negative beliefs about oneself.

There is inconsistency in findings, where self-blame was not a significant predictor of PTSD in the Study 1 but was significant in the Study 2. These incoherent results may emerge from the fact that the type of self-blame can differ between people (Janoff-Bulman, 1992). Behavioural self-blame relates to modifiable aspects of the person, such as changing behaviour in the future, which leads to fewer PTSD symptoms. The second type of self-blame assumes that people who use characterological self-blame finds a cause for the event in themselves, which increases the likelihood of similar events in the future. As a result, the PTSD intensity will rise. The CERQ questionnaire is not explicitly designed to differentiate between these two forms of self-blame. It is assumed that the homogeneity between participants in Study 2 may have promoted the presence of the characterological self-blame strategy, which accounts for the significant association with PTSD symptoms. On the other hand, both persistent other blame and self-blame that involves distorted beliefs about the cause and consequences of trauma are included in the PTSD criteria in DSM-5 (APA, 2013). Further studies should be conducted to support the need to include both strategies in NCPT.

There is a gap in the existing research regarding the association between NCPT strategies and PTD. Given that PTD involves negative changes in cognitive patterns, it was predicted that NCPT would be linked to PTD. The results of the initial study support this hypothesis, alongside with the presence of rumination, self-blame and catastrophizing as strategies predicting PTD. However, contrary to expectations, the strategy of blaming others was not found to be a significant predictor of PTD. This finding may suggest that blame of others may help in self-protection, similar to its role suggested above for PTSD.

Qualitative analysis strengthened the evidence from the self-report measures and revealed that trauma survivors have a tendency to use strategies that foster PTSD and PTD development, such as catastrophizing (32.1%) and rumination (13.2%). It can be assumed that a tendency to use NCPT can also be observed in narratives about the traumatic event. What is more, self-blame and blaming others are strategies that both appeared with a frequency of 7.9%, which indicates that they do not occur very often, although the mechanism of blaming seems important in the processing of traumatic events.

13.3 Linguistic Predictors of Trauma's Aftermath

The second hypothesis area aimed to investigate whether analysing the content of a narrative describing a traumatic event would enable us to predict the consequences of the trauma. For a more detailed analysis, a quantitative text analysis method was created to count the number of times words with particular meanings were used. In these analyses, four categories were considered as indicators of the chosen cognitive emotion regulation strategy: ***Exaggeration***, ***Blaming***, ***Acceptance*** and ***Positive Reappraisal***.

Qualitative analysis performed in the Study 1 indicated a small frequency of the ***Acceptance*** words' meanings in the corpora, as it was the least used cognitive emotion regulation strategy (3.6%). This explanation cannot be used for the ***Blaming*** category, as the blaming mechanism manifesting in both the self-blame and blame cognitive emotion regulation strategies (as assessed with CERQ) were used rather often (15.8 %). The low frequency in the narratives of words' meanings in the ***Blaming*** category in both studies (M = 0.01 in Study 1 and M=0.4% in Study 2) suggests that blaming is indicated in a more complex way than through isolated words' meanings that are directly connected with blaming someone else or the self. Positive reappraisal words' meanings category included separate subcategories and covered by

its definition a much broader aspect than positive reappraisal, as the cognitive emotion regulation strategy confirmed by the empirical evidence. ***Positive Reappraisal*** words' meanings category appeared 300 times in the text corpora during quantitative analysis, whereas in qualitative analysis was noticed by the raters 42 times. Although words' meanings included in the ***Positive Reappraisal*** category appeared more often than words meanings from other categories, they were not a significant predictor of PTG. This contradicts the literature review (Pennebaker 1993), so the relationship between positive reappraisal and PTG should be a subject of further research. The analyses performed for the four categories revealed only one significant relationship: ***Exaggeration*** predicted PTD in Study 1. It would be beneficial to broaden the scope of the study to enlarge the sample size and confirm that the ***Exaggeration*** category used in narratives is indeed an indicator of a catastrophizing strategy, rather than indicating catastrophizing as a cognitive distortion.

13.4 Limitations and Future Directions

Despite providing new knowledge of the factors for different types of posttraumatic readaptation, there are a few potential limitations concerning the results of this study.

First, in Study 1, subjects experienced a variety of traumatic events, including miscarriages, car accidents or loss of a loved one, in the dramatic situations which may have broadened the range of cognitive emotion regulation strategies compared to Study 2, in which all of the participants had experienced a car accident. Motor vehicle accidents are a specific form of trauma because they do not involve salient interpersonal aspects (Kelley et al, 2009). Less personally traumatic experiences such as car accidents are associated with a lower risk of PTSD than other personal events (Hapke et al., 2006).

Another limitation is the lack of data about pretrauma risk factors that should have been considered as an important variable in my model. Future research could use prospective studies that would enable researchers to include those factors in a more complex model.

Other possible directions could also consider including complementary self-report measures with other forms of objective measures of cognitive and emotional processes, such as neuroimaging or physiological measures, to provide a more comprehensive understanding of the mechanisms underlying PTSD. Additionally, future research could explore the potential moderating or mediating effects of other factors, such as social support, personality traits or culture, on the relationship between different type of posttraumatic cognitive processing and posttraumatic readaptation.

Another limitation concerns the negligible presence of the **Blaming** and **Acceptance** words' meanings in both studies. There were some doubts as to whether this was the result of incorrectly created categories or perhaps a mistake of the algorithm. The results of testing the accuracy of the algorithm through verification by competent judges did not give a clear answer to this matter.

The last limitation of this study was the use of an algorithm that classified the meaning of words into categories. Such solutions are always burdened by the risk of errors. This was confirmed by the analysis in Study 2, in which competent raters validated the work of the algorithm and showed that it did not recognize meanings from the context to a satisfactory degree. Increasing the accuracy by training the algorithm on a new data set would be possible with new narrative corpora.

13.5 Implications

These studies have theoretical implications for the broader field of understanding how trauma survivors process trauma. The results from both studies validated the distinction of two types of cognitive processing of trauma, positive and negative, which each include specific cognitive emotion regulation strategies. Each type is activated after experiencing a traumatic event as a cognitive way of incorporating traumatic experience into existing cognitive patterns, which is important in terms of dealing with the traumatic event. The findings of the present studies support the notion that acceptance and refocus on planning (indicating positive cognitive processing of trauma) are predictors of trauma aftermath such as PTSD, PTG and PTD. At the same time, the results of both quantitative and qualitative analyses call into question the long-held assumptions about the role of positive reappraisal in dealing with trauma.

Furthermore, the present research demonstrated a clear correlation between NCPT and the predicted trauma aftermath, and provided evidence that both catastrophizing and rumination are important in dealing with trauma. Surprisingly, the present studies yielded results that contradicted those in previous research on the role of blaming in the development of PTSD, showing that self-blaming plays a role as a predictor of PTSD (Study 2), although there were no similar relations found for blaming others (Study 1 and Study 2). This finding challenges the very foundation upon which previous research in this field has been built. These unexpected results for the role of blaming others and positive reappraisal highlight the necessity for further investigation to address these discrepancies.

Understanding the relationship between posttraumatic cognitive processing and trauma aftermaths may suggest intervention approaches and contribute to the support provided to trauma victims. The results of the studies indicate the necessity of supporting therapeutic efforts by

educating trauma survivors and supporting their positive posttraumatic cognitive processing. This may include teaching trauma survivors how to utilize refocus on planning, acceptance and positive refocusing strategies to promote positive changes. On the other hand, it is important for trauma survivors to recognize the potential impact of NCPT, which can take the form of catastrophizing and rumination strategies and contribute to negative outcomes. Another practical implication is implementing appropriate screening methods in hospitals or crisis centres where people receive psychological help after certain traumatic event to support the identification of people who are at risk for PTSD and PTD. Future research could investigate the association between types of posttraumatic cognitive processing and other PTSD predictors**.**

13.6 Summary

Both studies reported in the present thesis allowed the researcher to draw a number of conclusions regarding two types of posttraumatic cognitive processing and how they contribute to different trauma aftermaths. PCPT was a predictor of PTG and a negative predictor of PTD. Specifically, the present research showed that PTG can be predicted by two specific PCPT strategies: acceptance and refocus on planning. There was a lack of evidence that positive reappraisal strategy predicts any of the trauma aftermaths in both the quantitative and qualitative results. More studies should be conducted to explore whether PCPT can be a negative predictor of PTSD.

NCPT was a predictor of PTSD and PTD. The intensity of PTSD and PTD was specifically predicted by two specific NCPT strategies: catastrophizing and rumination. More evidence is needed to include the blame and self-blame strategies in this type of cognitive processing of trauma

It is important to note that the employment of narrative methodology confirmed the quantitative results, which strengthens the overall impact of the study and confirms the preliminary conclusions drawn from the quantitative research. Qualitative analysis confirmed that NCPT does not appear alone in the content of the story, but PCPT also appears.

The development of a method that allows for the counting of word meanings, rather than just counting words, can lead to more precise results in frequency analysis. Nevertheless, in my study only **Exaggeration** predicted PTD in the quantitative analysis, and the most representative category, **Positive Reappraisal**, did not show any significant results. The category of words related to blaming was fairly rare. Future studies could consider adding more lexical content to the **Blaming** category, as well as creating other categories such as positive refocusing, putting into perspective and refocus on planning. Additionally, the **Acceptance** strategy was difficult to identify in the text, so the use of more advanced NLP methods might be necessary to extract it, such as stylometric features as word counts, capital word counts, average sentence length or other measures such as vocabulary richness or machine learning methods (Manna et al., 2020; Neal, 2017; Savoy, 2020).

Although the generalizability of the current results must be established by future research, the present study has provided clear support for research on whether any algorithm can match the accuracy of a human in recognizing the proper meanings of words. Humans are more precise in this task than the NLP algorithm used in this research, which highlights the importance of not relying solely on algorithms. The role of algorithms in the analysis process should be considered as supportive rather than decisive. Investigating the natural language used in the narrative of a traumatic event represents a complex issue that necessitates further investigation.

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APPENDICES

Appendix A

Transcription of narrative's example

Example 1 – The shortest narrative.

Yes, so this event took place last year. It was [TIME]. It was around the time of my birthday, so I remember it. I mean, in general, I might come across as a person who is lonely. I don't have close contact with any family members. I don't know why this happened, but maybe I am that kind of person, or perhaps my close family just doesn't keep in touch. The only person I have a closer relationship with is my father, who lives in [PLACE] while I live in [PLACE]. I actually found out about this whole incident after the fact because I received a phone call from him when he was already in the hospital, in the ward. He had a heart attack and called an ambulance. He was taken to the hospital. Unfortunately, I couldn't go to see him during the day because I work and live in [PLACE], so it's not possible to go right away, literally within a few hours. As far as I remember, I went two days later. He had an operation, and I think he had a valve inserted. It was definitely a tragic experience, given that I'm alone and I was also very scared that I might lose him. And also, how to say it, he's an important person to me because I lost my mom in some very, very tragic circumstances just five years ago. So maybe we never really got along, me and my dad. However, we're on our own, so our relationship has changed a bit. And after those two days, I went to [PLACE]. I remember he was still in the hospital because I was at home and I picked him up after a week. Of course, I was also working with [PLACE] at that time, so I spent about two weeks with him. As of today, he's doing well. But what has changed is that I visit him more often, trying to see him once every two weeks. We call each other every other day so that I know what's going on with him. I ask how he's feeling and what's happening. However, of

course, women will tell you much more quickly what's wrong with them, what's happening, whereas unfortunately, my dad often gives superficial answers that he's feeling well, but sometimes he'll let slip that he actually felt bad but didn't want to tell me. So it's a bit uncomfortable because I don't know what to do next. Whether to move to [PLACE] and have closer contact with him there, or try to move him to [PLACE] in some way. But here, at a certain age, people don't want to move, and for me, it's also an uncomfortable situation to go back to [PLACE] after so many years. Especially since I have a job and a life, maybe more friends or acquaintances, in [PLACE]. So there's no possibility like that.

Example 2 – longest narrative

What happened, so in general I'm sorry if there will be additional sounds of my child well but that's how it must be. What happened. That particular difficult event was the birth. When did it happen? It happened it became I mean the birth itself took place [TIME]. On the other hand, it can be said that everything started a few days earlier. In the sense that the first contractions appeared I'll say so I gave birth it was Sunday morning, and those first contractions were on the Tuesday preceding that Sunday. So it kind of dragged on from Tuesday to Sunday. And who took part? Well mostly my husband I'll say that. Well, and a few, a dozen midwives and two, three doctors. So what did it all look like. Well it just started with the fact that there were these contractions, which were very painful, and there was some no bleeding like that. And my husband and I both thought it was already, because these contractions were fairly regular. So we went to the hospital precisely because of this bleeding well because we were just scared. It's our first baby and it wasn't like we knew what was going on, right? When we got to the hospital I suspect it was because of all the stress, because well I was stressed about the labor, in the sense of well it's hard not to be stressed when you give birth for the first time and often even multiple

births get stressed. Well, and the contractions just stopped. I was examined, hooked up to the KTG. In fact, these contractions were appearing. I was also examined by a midwife to see how dilated it was. And that dilation was about one centimeter. So it's like, well, because I live in [PLACE], here a little bit different than in [PLACE] all the care and during pregnancy, and labor, and postpartum. So I was sent to a kind of tele-waiting room, so to speak, where there are beds and what and what, and I just waited in that room to see if those contractions would return. Whether those contractions would return or not. Well, and those contractions didn't come back, so we were just sent home again. We went home well and so with these contractions I was for the next few days. They were so strong and so frequent during the day, let's say, that I was simply already so sore that it was hard to breathe. In the sense every breath caused pain. And we sort of called the emergency room, as it were, to relate it to Polish realities, so that because you sort of call it like that here. You don't go straight to the hospital when there's something going on or something, you just call first and say, and they decide if someone should come or not. Well, and we called and it was Friday that I just, that I can't anymore . In the sense that it's just not bearable anymore. These contractions were regular again. But so that they appeared and disappeared. In the sense they could be three hours regular then disappear, then reappear with varying frequency. Well, and but because of the fact that I was already just crying in pain, howling literally they told me to come. They said that at most they would give me morphine and see well, because it was as if there was nothing else they could do. So I came. When I arrived they hooked me up to an OCG. And when the midwife, who admitted us, saw this record of the ECG, I said no, you'll give birth in the morning for sure, you're dilated and everything. And when she did a kind of palpitation examination it turned out that there is still one centimeter of dilation. Well, and the contractions were such that she thought there was about five centimeters.

So well. It was a big surprise for all of us. Well, they gave me morphine and it actually helped, because I just, well, there were such contractions that announced that this baby was about to be born, and this dilation was not there, so it was such a difficult situation. Well, and they gave me this morphine, and I suspect it was so midnight. Something like that. And well, and I was kind of worried so hard about the fact that this dilation is not there and that I'm kind of not progressing, right? These contractions for so many days, and here nothing is progressing. And I in such pain, and I didn't know at all how it would be. I was afraid that they would just send me home again. Well fortunately they already left me in the ward. They said that, well, with such contractions they won't send me back, because, well, it's kind of too advanced, even though there is no dilation. Because generally here in Norway they don't admit me to the labor ward unless I'm at least four centimeters dilated. Well, but they left me. And well, well, my husband and I were just in it together, in that room where the birth was to take place. And so we waited. I was hooked up to this KTG the whole time. Well, and they told us to relax there, of course. It's hard to relax in such a situation. Well, but yes. I caught some sleep there, because that morphine actually sort of gave me such a breather, yes? I was just literally and figuratively able to breathe. Then I was given one more dose of morphine, and that was in the morning. Well, and of course, another examination showed that still this dilation is not advancing, and the contractions are regular and very strong. Well, and the lady during this examination just sort of well you can say forcibly this dilation. Well, and during this examination the lady simply increased this dilation, so to speak, by force. I mean by force, by examining and by, I don't know, massaging this cervix and in general she increased this dilation up to two centimeters simply crazy. Well, and so it was still this waiting. Due to the fact that here in Norway there's a huge attitude towards these births being natural. I, by the way, really wanted a natural birth. And it was sort of in the birth plan that

I provided that I indicated that I wanted to give birth by natural force. I was very afraid of a C-section, very much so. It was generally due to the fact that I suffer from five autoimmune diseases systemic lupus, endometriosis, Hashimoto's, Sjögren's syndrome and antiphospholipid syndrome, as it were, I have a lot behind me, by the way, also very traumatic and unpleasant experiences when it comes to doctors and hospitals. Well, and the whole health service. Also, well I am afraid and well I am often accompanied by such a kind of panic attack simply. That I start shaking, I start laughing so nervously, tears are pouring down my face. I'm not, as it were, able to control it. On the other hand, I kind of have this awareness in my head that nothing is happening to me, but well, it's beyond me, right? And I'm not able to control it. Well, and I sort of put it in this birth plan, too. I asked for understanding and precisely because I am so afraid of these various procedures, medical procedures and so on, that I would very much like to give birth by natural force. And that this cesarean would be a last resort. Well, so it was as if after this next morphine administration, they told me that they didn't want to give me this morphine again, for the reason that it's simply too much of a burden on the body and it might be too short a time to deliver. And this was Friday morning. Well, and as if they could explain that it could cause complications further on as if for the baby. The baby might not be so eager to give birth. Oh that's how it could be described. Also, they offered me a bath, because that was something I really wanted too. All in all, it was a big relief and just such actual relaxation to be able to take a bath and lie in the tub. So that was kind of the next, next stage. This relaxation in the tub was followed by more tests. Well, and still those centimeters there didn't appear spontaneously but they were just forced by the midwives. Well, and at this point it was probably already the third change of midwives, and it's kind of difficult for me, too, when I already with someone let's call it some contact and in general, then it's hard for me as if with another person to establish this

contact. And you know people are different. And as far as that midwife who admitted us was an angel, and I'm saying this also in retrospect when I get to the next events, because it's really thanks to her in this whole event, which is a terrible memory for me, well, she made me have such points, let's call them lights, yes? Such something that causes good memories oh yes. Well, and this next just midwife who was then was so just quite so Single. sorry I just have to get the baby to the breast. Also yes, she was very concrete and but in this concreteness of her this midwife well she was not the most pleasant. Oh so to speak. It came to this dilation to four centimeters, not immediately I said wrong. It was Saturday morning, sorry. We on Friday evening arrived, it was Saturday morning, so we are now Saturday afternoon. Well, and there was this dilation to four centimeters, and they said that well it's kind of been going on for so long, that and nothing is happening, that they're going to start stimulating this labor. Well, and I was given oxytocin. At the same time we apologize, because here we have a minor crisis. Sorry. So that they decided to give an epidural. Not epidural, oxytocin. And at the same time I was offered an epidural. I was tremendously, tremendously afraid of this epidural, and I sort of also had it included in this birth plan that this epidural I was asking for as a last resort and possibly that I would ask for it myself, that I sort of didn't want it. That I want to decide to give birth without anesthesia. On the other hand, they just said that, well, if they put on this oxytocin, things may turn out so that it would be better with this epidural. Besides, this epidural will bring me a lot of relief, they can no longer give me this morphine. Well they kind of argued very much in the direction of this epidural. Well I was terrified. Well, when I think about it, I was given sedatives, because, well, I wasn't able to calm down. I was just shaking like jelly. And it was uncontrollable for me. Well it was just, well it was just uncontrollable. And this decision was made that this epidural would be given well, because they said that anyway, if there was going to

be a C-section but there wasn't going to be, of course, I'm presenting it as if it was presented to me. And well, that if there's a C-section, you'll have to be induced anyway, so maybe it's better now, because at least I'll be relieved, I'll be able to rest. And so, well, they drugged me with these sedatives. And this midwife, who was the one who was kind of Single and seemed so unpleasant to me, and I so remember it was like I was crying to my husband that I didn't want with this midwife. It's just that this midwife I don't want with this midwife, because she's just so unpleasant. Somehow she gave such support. In the sense that in her concreteness she was kind of like well, she was just so Single, but in the sense that she reassured me that I could handle it. Well, and actually the anesthesiologist came in and as my husband said, because of course I had how to look at well, because they are poking in the back of the spine, but well I wouldn't want to for sure either. Well, but my husband so let's call it a peep well and held me. He said that this gentleman was just precision and well it was a moment. Actually as if I look at it now no fear has great eyes. Anyway, if it were to happen again I would still be very scared. Well, and well, there was a very big relief after the administration of sort of this anesthesia and actually I was able to sort of relax again. Which doesn't change the fact that I'll sort of describe it this way, that I once had a gastroscopy done and I was supposed to have this gastroscopy done under anesthesia. On the other hand, the doctor was in a hurry to go home, because I'm saying this because he just told me and they did it to me without anesthesia even though that's what it was, that's what it was, that was the recommendation from the doctor just referring me to the gastroscopy, that I was supposed to have it done under sort of general anesthesia. But that would have required more time, so this doctor said no well you can do it. I mean lady I was sixteen or seventeen years old. Well, and I had this gastroscopy done simply by force. Well I just felt like I was being raped literally. Well, and after that epidural I can say that I just had the same feeling. I felt like

someone just mentally raped me. Well, and so they actually administered this oxytocin. Well, and still nothing was happening. In the sense still this dilation was not progressing. It was only progressing as the midwife examined me, and then the doctor already. And they checked, with their fingers as if by force they increased this dilation. It is worth mentioning that aha in the meantime they pierced the fetal bladder and the waters poured out, which they said were supposedly clear. However, they were not transparent. They were already slightly colored. Well, and sorry, I got the order wrong. Those waters were punctured before the oxytocin was administered. Then this oxytocin was administered. Well, and just on that oxytocin, it all sort of came down to waiting for that labor to progress well because that oxytocin should make it happen. So they kept increasing that dose, because nothing was happening. Well, and sort of at some point they decided that well it's been so long without these fetal waters that they have to sort of give these waters again, these waters. And in order to do that well they had to do an ultrasound. It is worth adding that each time it was repeated that the baby was placed in a good position and that super after the examination just with their hands. As it turned out how they did this ultrasound, because this ultrasound they had to do in order to administer these fetal waters, in the sense of the preparation that imitated fetal waters, they had to do an ultrasound to know, as it were, where and how to guide probably it was a catheter. Anyway, the tube they had to insert this fluid replacing the fetal waters, so that the baby would have sort of more opportunities for, I don't know, movement. As it turned out on this ultrasound the baby was not positioned well at all because the daughter was positioned as if her head was tilted as if upwards and in a bad position in general. Also well she was just wedged in the birth canal actually. And when they saw at that moment that it was just this bad positioning, they introduced these waters, and what? And I started a battle to try to turn this baby, to get it in the right position. And well, I don't know it was

very late in the evening. It's hard for me to say what time exactly, but somewhere in the middle of the night simply. And changing positions and positions so different on all fours and this. And sort of changing these positions, and well it was sort of tiring, yes? It's important to me that as if, if they had done that ultrasound at the beginning then there wouldn't have been this whole situation at all, because they would have known that the baby was misplaced and then when she was still naturally in those fetal waters of hers, and in general you could very easily probably still maybe try to get her to twist better. On the other hand, after many hours of already this stimulation with this oxytocin, after very strong contractions, they stwie no tried to make this baby turn better. Of course, all this failed. They took in the meantime checked those fetal waters, which were already the color of mud literally. Well, and my husband was already very upset, because it was also already, as he just mentioned, that I had already received a second kind of epidural, and that was already the maximum they could give me. They had to change me to another, stronger agent because no more could simply be given. Well, and it's as if here the thing starts to happen very quickly, as these events occurred as if very quickly. Like such a chase. In the sense of well they see that this child is in a bad position, they check these waters, these waters are just the color of mud. On the monitor as if checking what's going on with the baby, they start popping up more and more, because there were already such alerts that said that, well, the baby is stressed, that already this pulse is falling, rising and all. At this point, it just starts to be a constant whine of this equipment, so to speak, which signals non-stop that the baby just sort of can't take any more. They decide to take a sample of that fetal water to see if the uterus can still handle it. Whether there's too much lactic acid in there, in those fetal waters, and at the same time the doctors, who are sort of young doctors, they go to consult, if I understand it correctly with the head doctor, the doctor who is above them. They come back, they come back this result

of this examination of these fetal waters, at the same time they immediately decide to turn off the oxytocin, because these alarms really well this equipment is howling nonstop. Despite turning off the oxytocin, these alarms don't stop showing up. They give me drugs that are supposed to totally sort of beat these contractions. In the sense they are supposed to turn off the effect of oxytocin, it doesn't happen. These drugs don't work. These alarms are howling all the time. It turns out that supposedly not on this lactic acid in these fetal waters. On the other hand, this alarm is already howling so much that they say no time, cesarean. And it was me within well for me it was two minutes. On the other hand, when I later talked to the doctor, it supposedly took up to ten minutes. I'm not able to say that, because really for me it was two minutes as the doctor returns and says C-section. And I'm already on the table and they start cutting me. I was shaking so and scared so, and my pulse was such that they just gave me some horse dose of sedatives. So so stupefied just fearing for my life and the baby's life and whether my husband would be with me well I say it just all happened like so fast I would say hard to register. Oh yeah. And this one I remember just lying on this table and just the anesthesiologist just checking if I feel anything. And I kind of think I can say that the important thing is that I talked to them all the time in English, because this Norwegian I don't speak fluently enough to feel comfortable. That's how I feel about English, so I talked to them in English. And they thought that I don't think I understand this Norwegian completely, where I do understand it a little bit though. And I remember such a thing, that they were sort of talking among themselves, and they are checking whether I feel just. In the sense because part of me they asked if I felt by touching me there on my stomach, I said I felt. Then I remember something like that, that they kind of talked among themselves to check that they were touching me when they didn't tell me that they were touching me kind of. I also remember kind of like, I don't know, I felt like they were trying to deceive me

a little bit, because they didn't believe that I could still feel. It's just that they gave me so much anesthesia or something, that I kind of like, well I had this feeling of like They didn't believe me that I was still feeling. So what? Somehow my husband showed up and was with me during thankfully the whole C-section thing. I also remember that they asked me if I was reflected in the lamp simply. Can't I see in the lamphouse, is my belly reflected and kind of where they're going to operate. Well, and then I felt such a well, such a tugging just me. I felt like such an object. I just felt like they were taking this baby out of me. And I remember that you couldn't hear the crying right away, as it were. At least for me, it was just really long moments before I heard that baby cry. Well, and then finally it happened. And I remember it's my husband saying he's crying, he's crying all right. Well, and they brought my daughter to me so touch to my cheek. Well, and they took her away. And then again there was this kind of silence. I say God Bartek she is not crying, something is wrong. Fortunately, fortunately she cried well, and I'll say I know, then all the time I felt this kind of tugging on me even though it was already after the birth, but they kept tugging on me so terribly. Then they called my husband to cut the umbilical cord there. Well, and there they somehow examined her, and my husband comes to me after this cutting of the umbilical cord and says that she looks like a mop. In the sense that she just had such a flattened nose, that it was kind of crushed for so long with those contractions, in that birth canal, that she just had a total crooked nose well and crushed. Well, but they came and said that everything was ok. And like I said, the midwife who admitted us she was also at the birth. And it was like she was such a, well, such a really angel, who was so gentle. She brought my daughter later to nurse me to the breast, and even though they were still stitching me up in there, my daughter was by my side. And I'm saying what I'm going to say now is a little bit from my husband's memory, on the other hand, because I was just so much, well, unaware and stunned by

those anesthetics and sedatives that I sort of don't remember it that way. Anyway like like until they put my daughter to the breast my pulse there was probably a hundred and fifty or something like that. Well they just couldn't get my pulse down. On the other hand, when they came to put my daughter to the breast, that pulse automatically just dropped to a normal there seventy or something like that. Another thing I'd like to add, during, as it were, this whole operation, suddenly such a nervousness began, because, as it turned out later, I got a very high temperature. Just like that from one minute to the next. And they didn't know what was going on. And it was a temperature of like I don't know thirty-nine degrees. And they just started giving some more antibiotics in the meantime. I remember this kind of nervousness that accompanied all this. Well, and later they sort of all of this so to speak is a bit of a time as if through a fog in this memory of mine, because it just seems to me that it's a matter of these drugs let's call them intoxicants that they gave me, these sedatives. Well, and then they took the daughter and took the husband for kangarooing. In the sense of having the husband kangaroo the daughter. And I remember that as I was straining and at that time they were sort of finally I guess closing me up and just started preparing me for transfer to the recovery room. Well, and I remember my great fear, because I was terribly afraid of the fact that a month earlier a friend of mine was in labor, who told me that she was separate from her husband for seven hours, and from the baby, before they let them sort of after this one, because it also ended with a cesarean, such a life-saving one. Well, and I remember just had it in my head just so terribly do not want to be without a husband. My husband is my refuge, my rock and gives me a lot of such strength. Well, and I was just so terribly afraid of the fact that I simply will not see him. And I remember that even though I sort of barely contacted anything, I kept asking when my husband would be with me, if my husband, if he knew where I was, if he would know where he was to come. Well, and they sort of I

remember sort of came later these doctors from that recovery room and they were picking me up from these doctors in the operating room. It was like they were flipping me from bed to bed and kind of talking among themselves like I was some kind of object. In the sense of totally like they weren't addressing me or anything. It was just like I wasn't there, like they were flipping a sack of potatoes literally. I remember just having this feeling that god just well this feeling that it's over, just that it's over. I'm going to be alone in that room already. I'll be left there alone, my husband won't be allowed in that room. Nobody even asked Even how I feel, they treat me like a sack of potatoes, the end. I just already had this kind of resignation about so totally. Well, and they moved me to this recovery room and I remember I was laid down by the clock that was hanging on the wall. And I remember I was so terribly tired but it was so terribly tired. I wanted so badly to sort of sleep but I remember I was just struggling so much to not close those eyes, to not miss that someone from the staff was coming, to be able to ask if my husband knew where I was and if he was going to be here right away, where my husband and my baby were. And I just remember such, such that I kind of opened those eyes forcefully just looking at that clock and just looking at how much time had passed. And just like that I remember such a strenuous, such a strenuous attempt to remember what time it is, where the pointer was and where it is now as I opened my eyes. And so that and just as it turned out as if fortunately my husband on the other side let's call it struggled in the same way to be by my side. And happily after half an hour already together with the baby they came to me in the recovery room. And then the doctor, who as it turned out later was just another such angel in that recovery room, was so simply empathetic. Really, another such empathetic person well I didn't meet later anywhere in this hospital, nor I think I came across such an empathetic doctor anywhere on my way before. So much so every time he approached he asked if everything was ok and made me feel just

comfortable, he spoke to me princess, offered to take pictures and my husband with the baby. As if he really was such a no he was such a golden man simply. He helped me, washed me. He washed me with such kind of gentleness. He offered to drink and some no just no man angel. Literally a man angel. From that still, because I know the feelings are important. From this period as my husband came to me simply so stressed my husband I have never seen in my life. Never in his life. As he told me later he thought it was all over, that he had lost both me and my daughter, and it was simply over. Just on this one, this C-section was just such seconds and minutes literally that he was just as terrified as I was. Well, and we just sat together in that recovery room and that we were both crying, because it was just so traumatic, such a horrible experience. How we were just treated, that first they assured us that there would be no cesarean, there would be no cesarean then within two minutes without anything they just took to the operating table. Of course, well I understand that as if they were saving their daughter's life. So there was no time to inform or anything just we both agree with my husband that if they had started talking earlier about this possibility of this cesarean, if they had started informing earlier, if they had done this ultrasound earlier, if simply this whole, this whole, this whole road to this cesarean, if it had been different all this would have looked different. Whereas it just all felt so rushed and so suddenly kind of forced. Well I do not know how to these feelings otherwise such forced literally. Well such with raped just like that. It would look all different. Well, and I was there for a couple of hours in that recovery room. As it turned out later I lost a great deal of blood. A very large amount of blood. It also turned out that the placenta was very large, so much so that they were so surprised by the size of the placenta that they sent it for additional tests. Well, and they sort of saw that I was totally weak. It's worth adding that there was a sort of serological conflict. Not the kind that is most common with the Rh group, that is, that there mom

is Rh negative, the baby is Rh positive just kind of a little different. Also they had to prepare special blood for me. And this blood was prepared. And they delayed giving that blood until two days after that operation, sort of after the C-section. I was a shadow of a person for those two days. I was paler than a wall literally. Really, when I look at the photos from that period, my lips were literally not even blue, because blue is where the blood is. They weren't even blue, they were just translucent. And so was I. Well just the pictures of how I looked in that recovery room is just well just a tragedy. I was so swollen, so pale, so weak looking, that well it's scary. Well, and then it was from that recovery room that we ended up in the postpartum ward. Well, and there began the so-called mexico of changing midwives and what, which one advises, When it comes to feeding, attachment. Struggling to get any, anything out of those firsts of mine so the baby would grab those nipples. Now I know that the frenulum was kind of too short, still the palate is in the wrong shape. And all this added up to the fact that I literally had wounds, deep holes simply in the nipples. And these midwives each came, each to a different one, each ordered delivery differently. I was very reluctant to give modified milk, because I was very keen on breastfeeding. It was even forced, I would say, this milk and this feeding of this modified milk. Like the whole stay in that postpartum ward was so, was so stressful. It should have been a time when I should have been able to rest. Whereas I wasn't. The only thing sort of positive about it was that we were given a so-called family room. It seems to me that a measure of how much they knew that the whole thing was, to put it ugly, spoiled this birth and all that, was that this family room they normally get for 24 hours after the birth, and then they move to a room where there are, for example, two couples, right? Two families. Whereas we got this family room for the whole five or six days that I was in the hospital, so my husband was with me the whole time. I'll tell you frankly that I can't imagine if he wasn't there, because I wasn't able for those first two

days until they gave me a blood transfusion then I wasn't able to get up. I wasn't able to. When they put me upright I practically passed out. I just no felt terrible. I didn't have the strength. Only actually no husband was giving me the baby to feed and taking me away. And he took care, he changed the diaper, everything. Because I wasn't able to. I actually say, I didn't get out of bed. And so, so to say, finishing this whole story well simply for me and my husband it was such a traumatic experience that even though we always thought we would have a big family, that we just always wanted to have a big family. We are building a house and there are a lot of rooms in the house in order to have a lot of children. It was in unison that we said that we don't know if we want to have more children, because simply this experience was so terrible that thinking about the fact that there would be another birth, as I recount it now I have a tightening in my stomach and I'm so sick of it. I'm just sick to my stomach from nerves. And from how awful the memory is. So, like how did it affect, what kind of impact did this event have? Well, it's just that my husband and I are strongly considering whether to have another child at all. I mean well at this point, because a little bit of time has passed and somewhere like this well I'm saying a little bit of this perspective came about, somewhere we started talking maybe, but I'm sure that before anything I would definitely have to go through therapy simply because I wouldn't be able to. I wouldn't be able to give birth just like that. So it kind of looks like that, that's what the whole event looks like.

Appendidx B

Examples of words' meanings within a category: Positive Reappraisal, Exaggeration, Acceptance, Blaming.

Category	Word	Meanings' number from plWordnet	Definition
Positive Reappraisal (Insight)	think	1	carry out the thought process
Positive Reappraisal (Causation)	because	-	conjunction connecting part of sentence
	that	-	conjunction connecting part of sentence
Exaggeration	constantly	1	uninterruptedly, incessantly, continuously, constantly
		2	such that something continues, someone or something has been some for a very long time, or something is repeated all the time
		3	continuously, steadily, without interruption, equally
		4	Continuesly
		5	Without breaks
Blaming	burden	3	accusing someone of committing some act, usually prohibited by law, holding someone responsible
		6	something that is a ballast, has a bad effect on a person, is a cause of mental discomfort for him or her
Acceptance	Adaptation	2	adapting something to new needs, changing something for new purposes
		3	The process of tuning an organism or organ to live/function under conditions that are new to it

	4	The process of adaptation of an individual to the new requirements of the situation or environment

Appendix C

Instruction for raters

In the following transcription, mark the sentences that describe a particular cognitive emotion regulation strategy used in coping with a traumatic event. It may happen that several strategies are included in one sentence, in that case mark the entire sentences twice and assign the strategy that is included.

1. **Self-blame** - attributing to oneself responsibility for events in which the person was involved. It can manifest itself in pointing out the actions that the person did during the event or those that he should have done or omitted in order not to lead to the event, e.g. "If I had asked her to fasten her seat belt then my mother might still be alive." or "I shouldn't have accelerated at that intersection, then that car wouldn't have run into me."

2. **Blaming others** - attributing responsibility for the events to others. The trauma survivor focuses on assigning blame for the event to others, looking for the causes of the event in actions that were omitted or performed, e.g. "I broke my leg because she felt like mopping the floor just then." or "She should refer her brother to a psychiatrist, then he wouldn't have tried to commit suicide."

3 **Rumination** - constantly thinking about an event and reliving the emotions that accompanied it. Thoughts can appear suddenly, the person constantly analyzes the whole event, its causes and consequences, e.g. "You know, I keep thinking about what would have happened if I had decided to call that ambulance sooner after all" or "I analyze the event step by step and come to the conclusion that, however, I did everything as well as I could. Unfortunately, the next day I think about it again and conclude something completely different. I wish I could finally stop thinking about it"!

4. **Catastrophizing** - focusing on the horror of the event and emphasizing its extremely traumatic nature. The person focuses more on the qualitative features of the event than on the facts. The description is characterized by a certain drama and even exaggeration. e.g. "That bang was so stunning! I was convinced that my eardrums were about to burst" or "Nothing worse could have happened. I didn't know it was possible to suffer so much."

5 **Acceptance** - accepting the event and its negative consequences. The person emphasizes that he is reconciled to the occurrence of the situation and is able to face what the future will bring, e.g. "It happened, I can't help it. Now I have instead of adapting to the new reality," or "I accepted the loss of my wife a long time ago. I have decided to build a life anew."

6**. Refocus on planning** - developing the steps that need to be taken to minimize the effect of a negative event. The individual focuses on things he or she can do to improve the situation, e.g. "Now I'm focusing on regaining my fitness, at the same time I'd like to take up a part-time job," or "What matters now is action, not wailing. Every day I reproduce the same pattern: I get up, dress myself and the children and go to the hospital to see my mother. As soon as mom gets better I plan to take her in."

7. **Positive refocusing** - focusing on positive thinking and things and events that evoke positive emotions. A person who has experienced a difficult event looks for ways to experience good emotions. E.g., "Every day before I get down to rehabilitation, I brew myself a cup of coffee. The smell of it makes me revive memories of my youth," or "Sometimes I lack motivation, like everyone, but then I call her and those moments of weakness pass."

8**. Positive reappraisal** - finding in the event positive values for the person and his personal development. A person sees the traumatic event they experienced as a catalyst for positive change, e.g. "I used to not appreciate moments with my family. Since the accident, every hour I

spend with him is a real treasure," or "His passing changed me, but if he had stayed I wouldn't have changed my life for the better."

9. **Putting into perspective** - placing the event in a broader context, which has the effect of lowering the seriousness of the event. A person downplays their own trauma by juxtaposing it with other, more serious events, e.g. "I have cancer, but I'm not the first and not the last" or "Amputating a finger is not a tragedy. They could have amputated my whole leg, then it would have been worse."

10. Insight – understanding and finding the meaning of an event, e.g., "I think this event has changed me."

11. Causation – indicating the mental consequences of the event, e.g., "Since that event, I have changed my attitude to life, because I know that I cannot influence everything."