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Guilt following trauma: Is trauma nature related to treatment outcome?

***A study on comparing post treatment guilt decrease among veterans and
policemen after traffic accidents and physical violence***

Master Thesis

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Abstract

The risk of acquiring PTSD is higher when performing certain professions, this might be due to moral injury. To get a better understanding and eventually being able to treat PTSD more effectively, studying this concept could be of importance. **Introduction.** During warfare, certain morally questionable or ethically ambiguous situations may arise, causing moral injury amongst service members, including feelings of guilt and PTSD. Policemen may experience similar traumatic events. Even road accidents (especially reckless drivers) can similarly lead to guilt and psychiatric problems, the most severe of them being PTSD. This is a problem because the feelings of guilt among drivers could get intensified by the combination of causing death, but also because of surviving the accident whilst friends or family might have died due to their actions. The aim of this research is to find out if guilt is associated with the nature of trauma and if guilt decreases post treatment more after experiencing a traffic accident compared to physical violence. **Method.** Guilt levels of veterans and occupational related traumatized clients from ARQ Centrum'45, are being compared pre and post treatment. **Results.** Guilt shows a significant decrease post treatment in general. However, in interaction with a specific type of trauma only clients who experienced a fire or explosion showed a significant decrease in guilt after treatment. **Conclusion.** Moderate feelings of guilt seem to be experienced post trauma and guilt decrease is associated with the nature (combination) of trauma(s) being fire or explosion, or combining traffic accidents and physical violence.

Introduction

Post-traumatic Stress Disorder (PTSD) has been recognized in psychiatry since the 1980s. The main symptoms of PTSD are re-experiencing the trauma through intrusive recollections of the trauma, actively avoiding internal and/or external reminders connected to the traumatic event, and alterations in arousal and reactivity (all criteria of PTSD according to the DSM-5 (APA, 2013) have been added in appendix 1). Veterans who have experienced combat operations, are known to often struggle with PTSD (Kesler et al., 1995). Currently, PTSD might be the main concept explaining deployment-related suffering. However, it has been highly criticized due to the low attention of the lasting impact to the suffering of moral aspects among veterans (Litz et al., 2009; Molendijk, Kramer, & Verweij, 2018; Shay, 1994). In addition, it is important to mention that due to the nature of their work and their responsibilities, policemen may experience similar traumatic events like the military population, (Pasillas, Follette, & Perumean-Chaney, 2006). Therefore, they form a group of people who potentially may be confronted with occupational related trauma and guilt, and are interesting to be studied, since there is an intention and occasionally a legitimization for injuring others (Lowinger & Solomon, 2004). The relevance of studying their guilt could help in getting a better understanding of for instance situationally based emotional distress, Major Depressive Disorder (in combination with worthlessness) and suicide risk (APA, 2013; Bryan et al., 2013). In this study specifically, the focus will be on the relationship between guilt and the nature of trauma.

Moral Injury

For service members, in any type of warfare, situations can arise which contain morally questionable or ethically ambiguous actions, like high levels of violence like shootings, direct fire at the enemy, being responsible for the death of an enemy and its aftermath (Litz et al., 2009). In addition, having unconventional features of war, e.g. guerilla warfare context (due to unmarked enemy and civilian threats) in an urban context makes it more challenging for service members to make decisions on prudent reactions despite the rules of engagement and ethics training (Litz et al., 2009). Research

shows that soldiers who took part in committing atrocities against civilians and prisoners had stronger feelings of guilt and are at higher risk for PTSD than soldiers who fought without close personal contact, from a distance (Hendin & Haas, 1984). This may be explained by moral injury. Moral Injury consists of anger, shame, social alienation and inappropriate guilt, which often happens after a traumatic event (Nash & Litz, 2013). The consequences (social and behavioral problems) of committing, being unable to prevent, witnessing or learning about acts that violate a person's perception of humanity, moral beliefs and expectations, are social alienation/withdrawal to aggression, misconduct and sociopathy (Nash & Litz, 2013). Possible signs and symptoms of moral injury might be: social and behavioral problems, trust issues, spiritual and existential issues, psychological problems, and self-deprecation (Drescher et al., 2011). Moral injury is more of a loss of trust in one's deeply rooted beliefs about the self or others' abilities to maintain the societies shared moral covenant (Nash & Litz, 2013).

Road accidents

Common causes for injuries, disabilities and suffering are road traffic collisions including collisions with drivers, passengers, pedestrians, or cyclists, which can lead to: the development of psychiatric problem, the most severe being PTSD (Blanchard et al., 1995; Taylor et al., 2001). This may include victims as reckless drivers, who may experience psychological damage after a road accident, especially as the reckless drivers may be suggested to be at greater risk for experiencing psychological damage after a road accident (Koren et al., 1999; Sayag, 2000;).

The main difference between road accidents and wars is the legitimacy provided for killing and the perpetrators' emotional readiness to be exposed to and cause death (Lowinger & Solomon, 2004). Their specific feelings of guilt get intensified by the combination of causing a death, moral injury, but also surviving the accident themselves whilst friends or family might have died due to their actions (Lowinger & Solomon, 2004). The study amongst 65 reckless drivers that have caused the death of people, mentions that the highest levels of guilt were experienced during the accident and the sentencing, and that drivers felt less guilt if they attributed the accident to bad luck. Among reckless

drivers who perceived their punishment as too easy, more feelings of guilt, shame, and PTSD symptoms were reported than drivers who regarded their punishment as appropriate or too severe (Lowinger & Solomon, 2004).

Guilt (as opposed to shame)

Guilt is defined as “an unpleasant feeling with accompanying beliefs that one should have thought, felt, or acted differently”, not to be confused with shame that is defined as “an unpleasant feeling involving a global negative self-evaluation, taking the perspective of the others (Stotz, Elbert, Müller, & Schauer, 2015). In addition, according to Stotz et al. (2015) it is important to make a distinction between guilt and shame, shame being an anticipated devaluation of the self, whilst guilt condemns a behavior, action or thought. Guilt comes from a care-providing system with the idea of not causing/ repairing harm done to others, whilst shame is more of status regulation, reputations and self-evaluation (Gilbert, 2007). These two emotions may have a serious implication for research as well as trauma therapy (Kubany & Watson, 2003). Based on the model of Kubany and Watson (2003) (see Appendix), a model has been developed (Figure 1) with relational pathways between trauma-related guilt and PTSD severity (Held, Owens, & Anderson, 2015). According to Held and colleagues (2015), trauma related guilt has a direct relation to the Emotion-Focused Disengagement coping, which is related to PTSD severity. Tobin and colleagues (1989) explain that when in a state of emotion-focused disengagement, one shuts themselves and their feelings off from others, which is then accompanied by criticism and self-blame for what took place. In addition, a direct relationship between trauma-related guilt and PTSD severity interceded by avoidant coping strategies, has been supported by research done by Held and colleagues (2011).

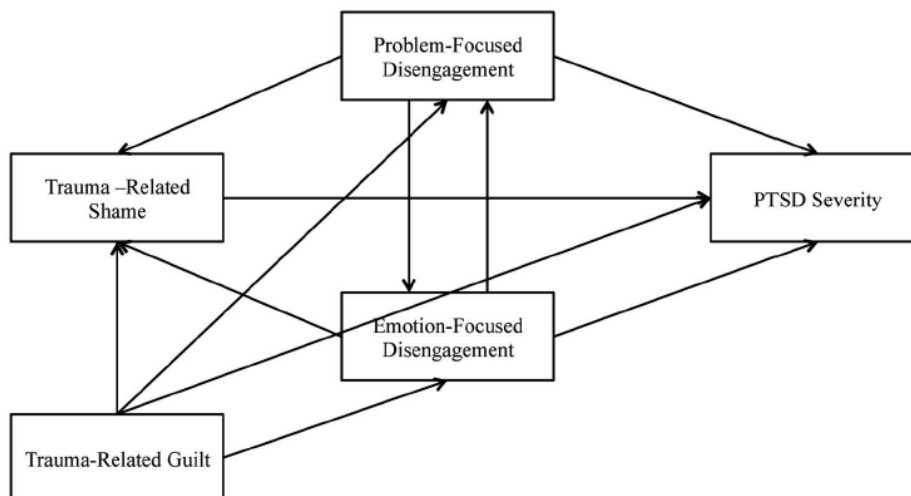


Figure 1. Original hypothesized path model.

There is a positive association between trauma-related guilt and trauma-related shame, both in direct and indirect sense (Held et al., 2015; Kubani & Watson, 2003). According to Held and colleagues (2015), the indirect relationships between Trauma-Related Guilt and Trauma-Related Shame are explained through two coping strategies; the Emotion-Focused and the Problem-Focused Disengagement. Problem-Focused Disengagement is associated with cognitive and behavioral strategies for situation avoidance and refers to the inability or reluctance to look at a situation differently, avoidance and denial. Interestingly, as is portrayed in the model, Tobin and colleagues (1989) explain that when relying on Emotion-Focused Disengagement coping strategies (when shutting off your feeling of from others, criticism or self-blame), it was often related with the use of Problem-Focused Disengagement coping strategies (avoidance, denial, having difficulties at viewing at situations differently), potentially being the link for the cognitive and behavioral strategies for avoidance of the circumstances.

Even though shame is a stronger predictor for PTSD severity, guilt still appears to be a unique contributor and is important in understanding and treating PTSD (Cunningham et al., 2018). This study further explains that from the 46% of the explained variance in PTSD, 65.2% can be explained by Trauma-related shame, whilst 34.8% may be explained by Trauma-related guilt. Guilt may be of a result of cognitive distortion of trauma related behaviors, e.g. thoughts about wrongdoing, whilst shame may

be linked to constant core beliefs that are resistant to change, e.g. believing in self-worthlessness (Cunningham et al., 2018). Guilt seems to be affected by cognitive restructuring and restitution, whilst an Emotion-Focused approach may be required in order to ameliorate shame (Cunningham et al., 2018). Guilt and shame have been used often interchangeably within clinical and general context (mainly to describe self-conscious and cognitive-affective states) (Bryan et al., 2013), yet there is a clear difference as mentioned before and the main focus of this research will be of explicitly on guilt.

Aim, research question and hypotheses

Even though guilt has been researched extensively, the literature shows little direct comparison between the different natures of trauma and guilt levels after therapy. Therefore, in this study the main goal is to measure how the nature of trauma is related to the guilt levels (prior and post therapy), in particular it will be tested if there is a difference in guilt level related to a traffic accident versus physical violence and fire and explosions. These types have been chosen due to the difference in their nature; traffic accidents representing a form of trauma where clients were less ready to be exposed to the trauma (the circumstance being unintended), physical violence representing a direct interpersonal trauma (higher risk of PTSD due to its close personal contact, with the expectation of having the highest guilt levels and being the hardest to treat, because of the clients' more conscious decision for its exposure), fire or explosion representing are included as an indirect personal trauma (without close personal contact, client might have been more prepared for its exposure, but it still has a potential accidental factor when it took place).

The hypotheses are as follows: Guilt caused by physical violence is likely to decrease less by therapy in comparison to a traffic accident or a fire or explosion. a. The effects of type of trauma: The differences in the reporting of guilt, amongst clients who experienced a specific kind of trauma (i.e. physical violence) are higher in comparison to those who did not. b. The effects of treatment: Clients report lower feelings of guilt at the end of treatment (T2) in comparison to the beginning of treatment (T1). c. The interaction effects between guilt, type of trauma and treatment: Clients who experience a

direct interpersonal type of trauma (physical violence) report higher levels of guilt post treatment, than non-direct interpersonal traumas.

Method

Design

This study provides a within-subjects design (where the same person tests different conditions) and a between-subjects design (where different people are tested from different conditions). The guilt levels of the clients who experienced different types of trauma are being compared from the beginning of therapy (T1) and a year after therapy (T2).

The study had a 3 (types: accident, fire and physical) by 2 (time: pre-, post-treatment) between subjects repeated measures design, with time as the within-subjects factor and type of event as between-subjects factor. Guilt was the dependent variable.

Procedure

The study took place at ARQ | Centrum'45, the Dutch national center for specialist diagnostics and treatment of people with complex psycho-trauma. The center improves their knowledge and expertise in psychopathology through scientific research and spreading through education. It is standard procedure at ARQ Centrum'45 to administer questionnaires before starting therapy in the context of the Routine Outcome Measurement (ROM). For those who did not drop out of therapy, the clients are asked to fill in these questionnaires again after a year of therapy. A data set was developed in this way. Different types of events were mentioned by the clients. As was discussed in the Introduction, in the current study the main focus is on: 1) traffic accidents, 2) Fire or explosion, and 3) Physical violence.

Participants

This study was based on data collected from 403 Veterans (50.4%) and occupational related traumatized clients (49.6%) (this group consists of 30.5% policemen, 17.4% unspecified occupational related traumatized clients, 0.7% humanitarian aid workers, 0.7% fire workers, 0.2% journalists). The tested clients consisted of 89% males and 11% female, with ages ranging from 21 to 78 years at the start

of the treatment ($M=45.54$, $SD=10.58$). The majority (86%) of the clients were born in the Netherlands, the rest were born in different countries, yet did their service in/for the Netherlands. However only the data of 112 clients were appropriate to use for this research, the rest of the participants did not fill in a second BSI-questionnaire, or they suffered from different types of trauma's than are mentioned in this thesis and therefore were excluded.

Instruments

The Brief Symptom Inventory (BSI). The BSI (appendix 4) is a 53-item-self-report questionnaire covering 9 symptom dimensions to identify relevant psychological symptoms (Derogatis, 1975). Guilt is one of the 4 items (the others are poor appetite, trouble falling asleep, thoughts of death or dying) that does not fall under 1 of those 9 dimensions, nonetheless due to its clinical importance they have been added to the questionnaire (Derogatis, 1975). The ranking of the test is on a 5-point scale ranging from 0 (not at all) to 4 (extremely), including R (Refused) (Derogatis, 1975). By having this standardized form, it gives the clinicians an opportunity to administer it without needing further training and a high level of reliability is being guaranteed and therefore it is widely used in outcome evaluation of psychotherapies. However, the validity of these scales has not been explicitly confirmed (Cramer et al., 2016). It is basically a simple, objective, reliable, valid and yet comprehensible measurement to identify a clinically relevant threshold for those in requiring treatment (Otte et al., 2019).

The Life Events Checklist (LEC). The LEC-5 (Gray, Litz, Hsu, & Lombardo, 2004); Dutch adaptation Boeschoten et al., 2014) is a 17-item self-report measure designed to screen for exposure to potential traumatic events meeting the A-criterion of PTSD according to the DSM-5 (see appendix). Respondents indicate varying types of exposure of different types of events (happened to me, witnessed it, learned about it, part of my job, not sure and doesn't apply). The events are further being specified in Appendix 3 (Gray et al., 2004). In addition, this questionnaire is simultaneously developed and is routinely distributed with the Clinician Administered PTSD Scale (CAPS) to assess exposure to potentially

traumatic events (Gray et al., 2004). The LEC-5 is method with a good validity, reliability with a high test-retest reliability for screening potentially traumatic events (Bae et al, 2008; Gray et al., 2004).

Statistical analysis

The data from the questionnaires were analyzed with the *IBM SPSS* program (IBM Corp., 2017), version 25 of 64-bit. The added *Syntax* file will portray the performed calculations in SPSS for this research. To measure guilt changes (as dependent variable) question BSI_52 (feeling of guilt, rated on a 5 point likert scale (from “not at all” to “very much”)) was used twice, prior to the treatment and around a year after treatment. To measure the different natures of trauma, the LEC items were used, in particular the score 1 = “happened to me” has been taken in consideration, which is dichotomously rated with either “Yes” or “No”. The next nature conditions were taken in consideration: 1) traffic accidents, 2) fire or explosion, 3) physical violence.

In order to obtain a general understanding of the relationship between guilt and the nature of trauma, a repeated measures ANOVA was performed with guilt (T1, T2) being the dependent variable and type of trauma (traffic accident, fire or explosion, physical violence) being the independent variable.

Results

Interaction between the types of trauma and guilt

When performing the Repeated Measures ANOVA in order to calculate the effects of guilt on our 3 main types of trauma together the following is shown: Mauchly’s test indicated that the assumption of sphericity has been met, therefore Greenhouse–Geisser corrected tests are reported ($\epsilon = 1.000$). Table 1 portrays an overview that analyses the averages (M) and standard deviations (SD) of guilt amongst the clients (N=112) in the beginning of treatment (Guilt 1) and after a year of treatment (Guilt 2) in the different types of traumas. Overall guilt has significantly decreased post treatment, $M_{t1} = 1.74$, $SD_{t1} = 1.661$, $M_{t2} = 1.21$, $SD_{t2} = 1.316$, $F(1,104) = 17.679$, $p = 0.000$. Few significant interactions have been found, one of the being the interaction between guilt, traffic accidents and physical violence F

(1,104) = 5.418, $p = 0.022$. Thus, these results suggest that guilt in general decreases significantly after a year therapy amongst the clients, however this is not the case when guilt is calculated in interaction with most traumas.

Table 1

Overview that analyses the guilt and the different types of traumas (N total = 112)

Measure		Guilt 1pre				Guilt 2post				Guilt 1		Guilt 2	
		Who experienced the trauma				Who did not experience the trauma							
Type of trauma	(N)	M	SD	M	SD	(N)	M	SD	M	SD			
Traffic accidents	(55)	1.89	1.42	2.19	1.24	(57)	2.19	1.39	1.72	1.42			
Fire or explosion	(39)	2.26	1.50	1.93	1.31	(73)	1.93	1.31	1.93	1.35			
Physical violence	(78)	1.99	1.39	2.18	1.34	(34)	2.18	1.36	2.18	1.36			

Traffic accidents

Guilt alone was significantly decreased post treatment $F(1,110) = 12.64, p = 0.001$. The results show that the decrease of guilt was significantly affected after the received treatment. However, the decrease in the interaction between guilt and traffic accidents was not significantly affected anymore by the treatment $F(1, 110) = 0.005, p = 0.942$.

Fire or explosion

Guilt alone seems to have been significantly decreased post treatment amongst the clients with $F(1,110) = 17.985, p = 0.000$. In addition, there seems to be a significant decrease in the interaction between guilt and fire or explosion which was affected by the treatment $F(1, 110) = 6.217, p = 0.014$. This is the only condition where both guilt and the interaction of guilt and a trauma were significantly decreased.

Physical violence

The results show that guilt alone was significantly affected by the giving treatment amongst the clients with $F(1,110) = 10.784, p = 0.001$. Though, the decrease in the interactions between guilt and physical violence was not significantly affected anymore by the received treatment $F(1, 110) = 0.001, p = 0.975$.

“Single type of trauma” variables

Due to an overlap of the experienced traumas amongst the clients, a separate variable has been created where the interaction of guilt is being calculated with the types of trauma variables in a “pure” form. In these variables, clients have been tested who reported only one single traumatic experience, in order to test the difference in the decrease of guilt in the different natures of trauma. Mauchly’s test indicated that the assumption of sphericity has been met, therefore Greenhouse–Geisser corrected tests are reported ($\epsilon = 1.000$). Table 2 portrays an overview that analyses the averages (M) and standard deviations (SD) of guilt amongst the clients (N) in the beginning of treatment (guilt 1) and after a year of treatment (guilt 2). Guilt alone in the “single type of trauma” condition with the individualized trauma’s shows a non-significant effect $M_{t1} = 2.583, SD_{t1} = 0.246, M_{t2} = 2.017, SD_{t2} = 0.274, F(1,161) = 3.997, p = 0.067$. Furthermore, no significant interaction has been found in the interaction of guilt and trauma type $F(2,30) = 1.196, p = 0.317$. However, in graph 1, a clear strong decrease was visible for those who experienced a traffic accident, then those who did not. Further calculations have been performed to see if there is a significant decrease for each trauma individually as “pure” variables.

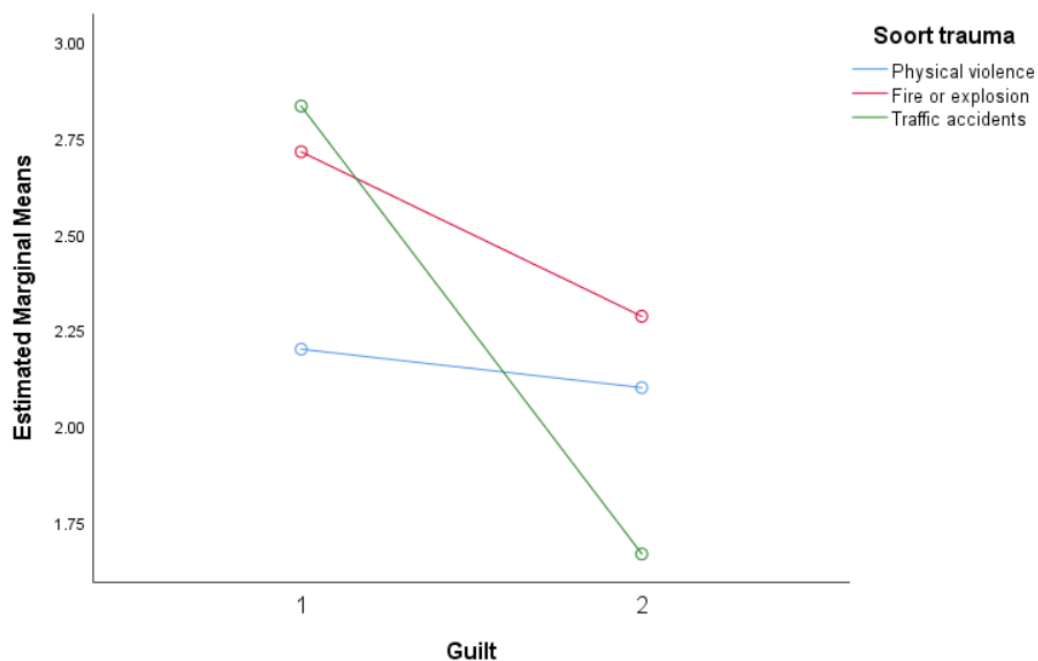
Table 2

Overview that analyses the guilt in the different single type of traumas

Measure	Guilt 1				Guilt 2					
	Who experienced the trauma				Who did not experience the trauma					
Single Type of trauma	(N)	M	SD	M	SD	(N)	M	SD	M	SD
Traffic accidents	(6)	2.83	1.33	1.67	1.37	(157)	2.03	1.34	1.57	1.34
Fire or explosion	(7)	2.71	0.95	2.29	1.38	(156)	2.03	1.36	1.54	1.33
Physical violence	(20)	2.20	1.13	2.10	1.37	(143)	2.04	1.36	1.50	1.32

Graph 1

“Single type of trauma” individually analyzed



“Single type of trauma” Physical violence

Guilt alone shows a significant decrease $F(1,161) = 3.655, p = 0.048$. Furthermore, no significant interaction has been found in the interaction between guilt and physical violence $F(1,741) = 1.886, p =$

0.172. These results mean that guilt decreases significantly, however not when interacting with Physical violence post treatment.

“Single type of trauma” Fire or explosion

Guilt alone shows a non-significant effect $F(1,161) = 3.050, p = 0.083$. Furthermore, no significant interaction has been found in the interaction between guilt and fire or explosion $F(1,161) = 0.015, p = 0.902$. Therefore, there is no significant decrease of guilt, nor when interacting with the trauma after the received treatment.

“Single type of trauma” Traffic accidents

Guilt alone shows a significant effect $F(1,161) = 8.315, p = 0.004$. Furthermore, no significant interaction has been found in the interaction between guilt and traffic accidents $F(1,161) = 1.423, p = 0.217$. This means that guilt decreases significantly, yet not when interacting with a traffic accident.

Discussion

The main focus of the study was on guilt following a type of trauma and on the question whether the nature of trauma is related to the treatment outcome. Although the results of the present study were derived from a big sample of veterans and occupational traumatized people, only data from a limited number of clients were appropriate for testing and even fewer for more “single type of trauma” testing. This is relevant in order to test the relationship between guilt and the nature of trauma (prior and post therapy) and to test the hypothesis that guilt caused by physical violence is least likely to decrease by therapy, in comparison to a traffic accident or a fire or explosion.

The effects of the type of trauma

Clients who experienced fire or explosion reported on average the highest levels of guilt in the initial stage. This is quite surprising due to the expectation, that those who were involved in physical violence should have had the highest reports on guilt. Perhaps moral injury can play a role: military training could have modified the way that a client views certain situation and made him more prepared for a traumatic experience and obtained a form of resilience (Bonanno et al., 2019). Clients who

experienced traffic accidents reported the lowest levels of trauma, which confirms the low initial guilt-level expectations. Those who did not experience traffic accidents reported the highest levels of guilt (they might have gone through interpersonal trauma), which also supports the hypothesis. The literature suggest that the durability of the traumatic experience may be of significance, the longer the traumatic experience took place, the more one tends to dissociate (an important PTSD predictor) in order to cope with the situation itself (Van der Kolk, 2000). An explanation could be that the fire or explosion trauma took place over a longer timespan than the other traumatic experiences, causing the clients having feelings of guilt for not feeling, acting or reacting differently (Stotz, Elbert, Müller, & Schauer, 2015).

In the “single” variables, it seems that clients who went through only a traffic accident reported the highest feelings of guilt, and the lowest reports were of those who went through physical violence, which goes against expectations. It could suggest that clients may found a way to justify their physical violence (creating potentially lower levels of moral injury) by being prepared for potential interpersonal violence and its legitimacy, whilst those in a car accident were not psychologically prepared to be exposed to the trauma (Lowinger & Solomon, 2004). Those who did not experience the “single” traumas had the same levels of guilt as those who had a combination of traumas.

The effects of treatment

Regardless of the experienced type of trauma amongst the clients, they seemed to experience overall moderate feelings of guilt at the beginning of treatment according to the results of the BSI. Furthermore, guilt appears to decrease significantly amongst most variables, which strongly supports the positive effect of therapy amongst clients. This could be explained by the fact that evidence-based psychotherapies are being practiced, especially prolonged exposure therapy and cognitive processing therapy are most established for moral injury treatment (Griffin et al., 2019). The greatest decrease of guilt after treatment was amongst those who experienced fire or explosion and the smallest decrease took place for the clients who happened to have lived through a traffic accident. An explanation could

be the that the levels of guilt amongst the traffic accidents are due to lack of malicious intent (Lowinger & Solomon, 2004). For those who did not experience traffic accidents, their guilt average decreased equally to those who did not experience physical violence, whilst the clients that did not experience a fire or explosion's average guilt had a low decrease.

In the "single" variables, the strongest decrease in the average guilt levels was for those who experienced a traffic accident and the smallest was for the physical violence group, supporting other studies on the challenge of treating interpersonal trauma, with a higher moral injury. These findings support the hypothesis. It may be supporting the fact that soldiers who committed atrocities and fought with close personal contact, had higher feelings of guilt than in the other conditions (Hedin & Haas, 1984). However, more clients should be tested in this condition in order to take these results in consideration. For those who did not experience a "pure" variable, their average guilt decreased only a little.

The interaction of guilt, type of trauma and treatment

According to the hypothesis, the expectation was that the decrease would have been most significant for the interaction between guilt and physical violence post treatment and least for guilt and traffic accident, yet their significance does not differ much. In this research, guilt significantly decreases only by certain combinations of experienced types of trauma besides fire or explosion. The other significant decrease post treatment was of the interaction between the guilt, traffic accidents and physical violence. This means that the coping strategies learned in therapy, could be more effective on the restructuring on the dysfunctional cognitions and produced a more balanced and realistic beliefs (Resnick, Monson, & Chard, 2017), may eventually help the Problem-Focused and Emotional-Focused Disengagement and clients can apply them across the different types of experienced traumas. Another explanation could be that the feelings of guilt may decreased significantly due to dealing with the feelings of shame during therapy and are no longer solely left with the feelings of self-blame and criticism (Tobin et al. 1989).

In the “single type of trauma” variables, no significant interactions have been found. The most significant decrease was for the interaction between guilt and physical violence (which confirms the initial hypothesis) and the least was the interaction of guilt and fire and explosion. This may be due to the fact that the sense of guilt can be even more intense when one causes the traumatic event and was not just exposed to it (Lowinger & Solomon, 2004). The lack of significance could be explained by the lack of clients that experienced single type of trauma.

Limitations

There are numerous limitations in this study. Firstly, the types of therapy that clients received have not been specified. It could be that some types of therapy are more effective in the modification of guilt than others. Secondly, it is unclear from the presented data whether the clients were those who caused the accident/ fire/ violence, or whether this had happened to them. This could have a significant impact on the experienced guilt levels amongst clients, since according to the literature those who took part in committing atrocities had higher feelings of guilt and are at higher risk for PTSD. Furthermore, there is an overlap of traumas amongst clients, preventing from getting clear results for the nature of trauma. In the “single type of trauma”, where there is no overlap, only too few clients are left to study. Besides, prior to the experienced trauma, not all clients received the same type of training, which could have potentially prepared clients on moral injury. Soldiers for example, may have been trained in rules of engagement and ethics training, whilst other occupational related traumatized clients may not have gotten any of this kind and may not be able to “blame” their decisions on a past training, this might influence the guilt levels. In addition, it is unclear what the background is of the 17.4% of unspecified occupational related traumatized clients are, it is unknown if this could be of influence for the results. Furthermore, the frequency or the severity of the experienced traumas are unknown, which could be significant in the levels of experienced guilt or PTSD. Even though the database was based on 403 clients, not many finished the year of treatment, filled in the second BSI and only a few reported truly a single type of trauma (which prevents to make a valid comparison between the different natures of

trauma). Finally, it is unclear from the data if the clients were obligated into treatment or whether they did it out of their own will. Treatment could be less effective if the client is not motivated to actively change cognitions or behaviors.

Future research

From the literature, it is undeniable that guilt is closely related to shame when dealing with those who suffer from PTSD. In future research, it would be advisable to take shame into consideration, as this appears to be a big factor in treatment, more so when modifying feelings of guilt. Another interesting factor to take into consideration would be the length of received treatment, would it decrease more if the client would have treatment longer periods of time? Or does guilt decrease regardless of treatment? Furthermore, it could be advised to research the effectiveness of (military) training on moral injury, and if it decreases guilt and eventually also the risk for PTSD. In addition, it could be of interest to research how certain combinations of experienced traumas may cause significant decrease in guilt levels, and other combinations do not.

Conclusion

Amongst this sample of clients, moderate feelings of guilt seem to be experienced prior to the treatment. In addition, treatment seems to be associated with the decrease of the overall guilt levels. Post treatment decrease of guilt is associated with the nature (combination) of trauma(s), particularly only clients who experienced a fire or explosion showed a decrease in guilt after treatment or the combination of traffic accidents and physical violence.

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Appendix

1) PTSD Criteria according DSM-5

According to the DSM-5 several criteria need to take place in order have a PTSD diagnosis. For Criterion A of the diagnosis, you need to either have experienced, have someone witnessed, learn that a family member/ close friend has experienced a traumatic event, or have repeated extreme exposure to aversive details of traumatic event(s) (American Psychiatric Association [APA], 2013). Additionally (criterion B), one must experience at least one of the following intrusion symptoms, related to the trauma, from the onset of the event; intrusive distressing memories, recurrent distressing dreams, dissociative reactions (e.g. flashbacks), intense or prolonged distress at exposure to cues of the traumatic event, and marked physiological reactions to cues that resemble the traumatic event(s) (APA, 2013). For Criterion C one must actively avoid internal (e.g. thoughts, memories) and/or external (e.g. situations, conversations) reminders connected to the traumatic event (APA, 2013). Furthermore, for Criterion D negative alterations in cognitions and mood needed; inability to remember an important aspect of the traumatic event(s), persistent and exaggerated negative beliefs about oneself or the world, persistent distorted cognitions about the cause and consequences of the traumatic event, persistent negative emotional state, markedly diminished interest, feelings of detachment, inability to experience positive emotions (APA, 2013). Also, for Criterion E, at least 2 of the following alterations in arousal and reactivity occur; irritable behavior and angry outbursts, reckless or self-destructive behavior, hypervigilance, exaggerated startle response, concentration issues, sleep disturbance (APA, 2013). Finally, the duration of the symptoms (Criteria B-E) is at least 1 month, causes significant distress and impairment in functioning, and the disturbance is not attributed to the physiological effect of a substance or another medical condition (APA, 2013)

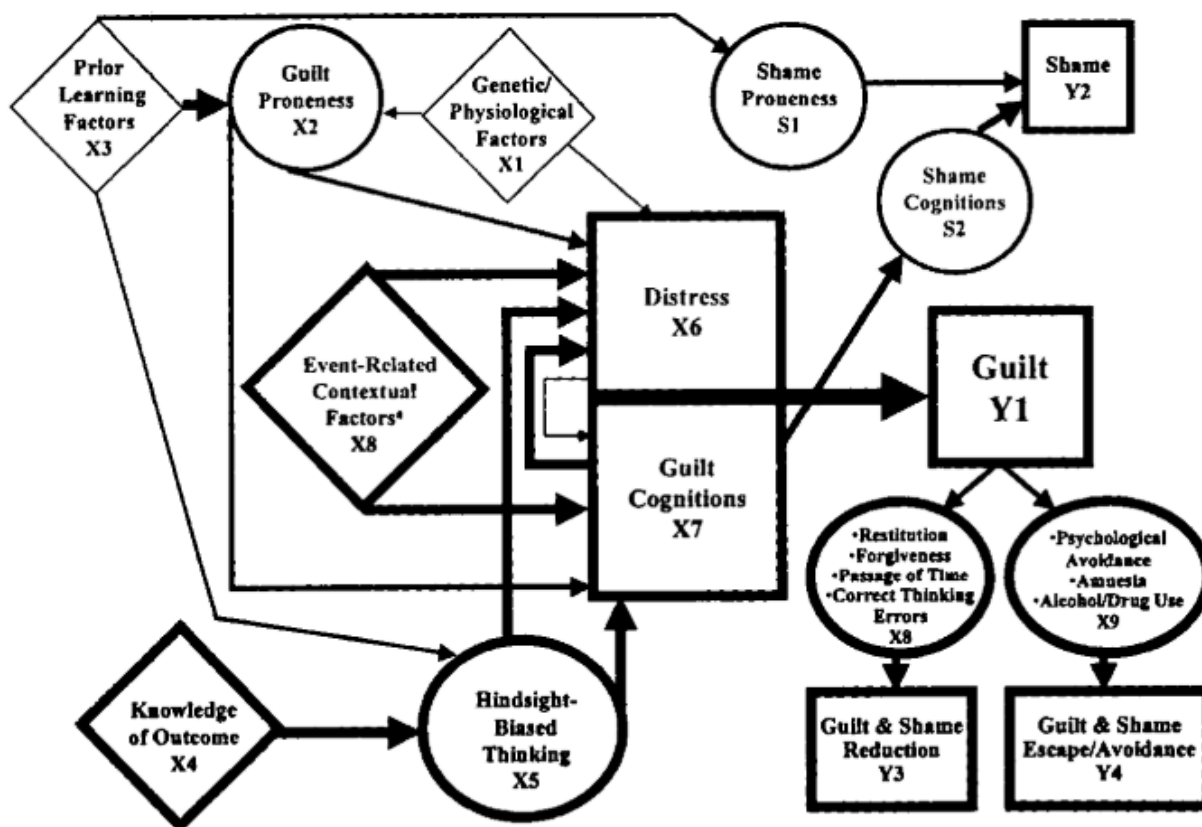


Figure 1. A causal model that accounts for guilt given the occurrence of a negative event.

Note. The width and direction of the arrows indicate the hypothesized strength and direction of relationships. Modifiable causal variables are presented as circles. Unmodifiable causal variables are presented as diamonds. The width of the circle boundaries indicate the hypothesized degree of modifiability. The width of the squares indicate the importance of the primary dependent variables.

^aContextual factors include (a) proximity to a negative event, (b) amount of damage or harm, (c) harm to a close relationship partner, (d) reversibility/irreversibility of harm, (e) human-caused negative events versus acts of God, (f) situations where all options have negative consequences, (g) arbitrary or inequitable harm, and (h) blame from others.

^bGuilt cognitions include beliefs about (a) preventability (b) personal responsibility, (c) wrongdoing, and (d) lack of justification.

Brief Symptom Inventory BSA

"Here I have a list of problems people sometimes have. As I read each one to you, I want you to tell me **HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY.** These are the answers I want you to use. *[Hand card and read answers.]*

Do you have any questions?"

0 = Not at all
 1 = A little bit
 2 = Moderately
 3 = Quite a bit
 4 = Extremely
 R = Refused

DURING THE PAST 7 DAYS, how much were you distressed by:

1. Nervousness or shakiness inside	0	1	2	3	4	R
2. Faintness or dizziness	0	1	2	3	4	R
3. The idea that someone else can control your thoughts	0	1	2	3	4	R
4. Feeling others are to blame for most of your troubles	0	1	2	3	4	R
5. Trouble remembering things	0	1	2	3	4	R
6. Feeling easily annoyed or irritated	0	1	2	3	4	R
7. Pains in the heart or chest	0	1	2	3	4	R
8. Feeling afraid in open spaces	0	1	2	3	4	R
9. Thoughts of ending your life	0	1	2	3	4	R

DURING THE PAST 7 DAYS, how much were you distressed by:

10. Feeling that most people cannot be trusted	0	1	2	3	4	R
11. Poor appetite	0	1	2	3	4	R
12. Suddenly scared for no reason	0	1	2	3	4	R
13. Temper outbursts that you could not control	0	1	2	3	4	R
14. Feeling lonely even when you are with people	0	1	2	3	4	R
15. Feeling blocked in getting things done	0	1	2	3	4	R
16. Feeling lonely	0	1	2	3	4	R
17. Feeling blue	0	1	2	3	4	R
18. Feeling no interest in things	0	1	2	3	4	R

0 = Not at all

1 = A little bit

2 = Moderately

3 = Quite a bit

4 = Extremely

R = Refused

DURING THE PAST 7 DAYS, how much were you distressed by:

19. Feeling fearful	0	1	2	3	4	R
20. Your feelings being easily hurt	0	1	2	3	4	R
21. Feeling that people are unfriendly or dislike you	0	1	2	3	4	R
22. Feeling inferior to others	0	1	2	3	4	R
23. Nausea or upset stomach	0	1	2	3	4	R
24. Feeling that you are watched or talked about by others	0	1	2	3	4	R
25. Trouble falling asleep	0	1	2	3	4	R
26. Having to check and double check what you do	0	1	2	3	4	R
27. Difficulty making decisions	0	1	2	3	4	R

DURING THE PAST 7 DAYS, how much were you distressed by:

28. Feeling afraid to travel on buses, subways, or trains	0	1	2	3	4	R
29. Trouble getting your breath	0	1	2	3	4	R
30. Hot or cold spells	0	1	2	3	4	R
31. Having to avoid certain things, places, or activities because they frighten you	0	1	2	3	4	R
32. Your mind going blank	0	1	2	3	4	R
33. Numbness or tingling in parts of your body	0	1	2	3	4	R
34. The idea that you should be punished for your sins	0	1	2	3	4	R
35. Feeling hopeless about the future	0	1	2	3	4	R
36. Trouble concentrating	0	1	2	3	4	R

0 = Not at all

1 = A little bit

2 = Moderately

3 = Quite a bit

4 = Extremely

R = Refused

DURING THE PAST 7 DAYS, how much were you distressed by:

37. Feeling weak in parts of your body	0	1	2	3	4	R
38. Feeling tense or keyed up	0	1	2	3	4	R
39. Thoughts of death or dying	0	1	2	3	4	R
40. Having urges to beat, injure, or harm someone	0	1	2	3	4	R
41. Having urges to break or smash things	0	1	2	3	4	R
42. Feeling very self-conscious with others	0	1	2	3	4	R
43. Feeling uneasy in crowds	0	1	2	3	4	R
44. Never feeling close to another person	0	1	2	3	4	R
45. Spells of terror or panic	0	1	2	3	4	R

DURING THE PAST 7 DAYS, how much were you distressed by:

46. Getting into frequent arguments	0	1	2	3	4	R
47. Feeling nervous when you are left alone	0	1	2	3	4	R
48. Others not giving you proper credit for your achievements	0	1	2	3	4	R
49. Feeling so restless you couldn't sit still	0	1	2	3	4	R
50. Feelings of worthlessness	0	1	2	3	4	R
51. Feeling that people will take advantage of you if you let them	0	1	2	3	4	R
52. Feeling of guilt	0	1	2	3	4	R
53. The idea that something is wrong with your mind	0	1	2	3	4	R

3)

Life Events Checklist

Listed below are a number of difficult or stressful things that sometimes happen to people. For each event, check one or more of the boxes to the right to indicate that: (a) It *happened to you* personally, (b) you *witnessed it* happen to someone else, (c) you *learned about it* happening to someone close to you, (d) you're *not sure* if it applies to you, or (e) it *doesn't apply* to you.

Mark *only one* item for any single stressful event you have experienced. For events that might fit more than one item description, choose the one that fits best.

Be sure to consider your *entire life* (growing up, as well as adulthood) as you go through the list of events.

<i>Event</i>	<i>Happened to me</i>	<i>Witnessed it</i>	<i>Learned about it</i>	<i>Not Sure</i>	<i>Doesn't apply</i>
1. Natural disaster (for example, flood, hurricane, tornado, earthquake)					
2. Fire or explosion					
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)					
4. Serious accident at work, home, or during recreational activity					
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)					
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)					
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)					
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)					
9. Other unwanted or uncomfortable sexual experience					
10. Combat or exposure to a war-zone (in the military or as a civilian)					
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)					
12. Life-threatening illness or injury					
13. Severe human suffering					
14. Sudden, violent death (for example, homicide, suicide)	<i>N/A</i>				
15. Sudden, unexpected death of someone close to you	<i>N/A</i>				
16. Serious injury, harm, or death you caused to someone else	<i>(Check here if you were directly involved)</i>				
17. Any other stressful event or experience					

4)

"Single type of trauma" variables graphs

