

# Long-term trajectories of PTSD or resilience in former East German political prisoners

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## Abstract

Studies on the long-term consequences of traumatization found different diagnostic trajectories: chronic, recovered, delayed and resilient. This distinction, however, was never studied in victims of torture or severe political persecution. We aimed to verify the trajectory classes of PTSD empirically and to analyze potential predictors of such trajectories. Former political prisoners from East Germany, first interviewed in 1995, were re-assessed fourteen years later. In 1995, retrospective symptom reports dating back to shortly after the prisoners' release dates were assessed. Predictors of the four different trajectories were divided into pre-trauma, peri-trauma, and post-trauma factors. As a result, the four long-term trajectories were validated in the current sample with the following percentages: chronic (36%), resilient (27%), recovered (26%) and delayed (11%) trajectories. Trajectories were mainly distinguished by pre- and post-traumatic factors, e.g. pre-trauma education or post-trauma disclosure opportunities. We conclude that the four long-term trajectories of trauma sequelae deserve more attention to adequately

deal with survivors of severe persecution. Furthermore, the specific predictors of long-term trajectory deserve more attention for re-integration or in rehabilitation.

*Key words:* Torture, PTSD, psychological resilience, East Germany

## Background

Severe political persecution as in imprisonment is a prototype of a traumatic stress that has often been shown as a cause of posttraumatic stress disorder (PTSD) during adult lifespan.<sup>1-3</sup> Studies on former political prisoners from East Germany (or the former German Democratic Republic: GDR) tried to contribute to this knowledge. During GDR's 40 years of existence, more than 200,000 persons were imprisoned for political reasons or random suppression to prevent political opposition (e.g. detention at workplaces after minor critical comments). Historians have argued for distinguishing between eras which have presented with differing prison conditions: the Stalin era (until 1953), with common use of all forms of physical torture as well as high mortality rates; the Ulbricht era (until 1971), with physical and increasing psychological torture utilization; and the Honecker era (until 1989), with primary psychological torture (e.g., threatened death or disappearance of

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the individual or close family members), but also physical torture like sleep deprivation or floodlight exposition.<sup>4</sup>

Recently, increasing numbers of longitudinal studies have investigated the long-term course of PTSD from different origins. However, as yet, no studies have focused on political prisoners or torture victims. This general psychotraumatological research has shown that the simple belief of a chronically sustained course of PTSD being the norm — if not treated successfully by therapy or the occurrence of a spontaneous remission — must be revised. Specifically, evidence shows changes to the course of PTSD over time in the form of delayed<sup>5,6</sup> or fluctuating symptoms over extended years or decades.<sup>7-9</sup> Bonanno<sup>10</sup> proposed a classification of post-traumatic trajectories which distinguishes between chronic, recovered, delayed and resilient courses. This classification system is now widely accepted in PTSD research but rarely recognized in a wider audience of clinicians or other professionals in trauma rehabilitation.<sup>11-13</sup>

In addition, this empirically-based typology allows for systematic investigation on the predictors of these course specifiers. One question is if current circumstances of the individual are more predictive of course classes than the pre-traumatic (e.g., age, gender, education, previous trauma) or peri-traumatic influences (e.g., trauma severity, subjective suffering).<sup>7,12</sup> Solomon and Dekel<sup>7</sup> demonstrated in ex-prisoners of war that current stress and symptoms predict the course pattern over 30 years. Dickstein et al<sup>12</sup> demonstrated in a sample of peacekeeping soldiers in conflict areas, that current stress and depression turned out to be the main predictors of delayed PTSD. These study findings match the results of comprehensive meta-analyses which have demonstrated post-traumatic contexts of the trauma

survivors, like current social support, are the strongest predictors of the severity of PTSD.<sup>14</sup> Our own previous work with ex-political prisoners and other victims of man-made violence led us to postulate that social-interpersonal post-traumatic factors such as the opportunity to disclose and the willingness to forgive are of particular importance for the prediction of progression of PTSD.<sup>15</sup>

Most longitudinal studies of traumatized individuals are based on retrospective data of immediate psychological consequences within days, weeks or months following the end of their traumatic experience (e.g., political imprisonment). For example, Port, Engdahl and Frazier<sup>16</sup> conducted a "retro- and prospective longitudinal study" of prisoners of war in which World War II veterans were assessed retrospectively shortly after repatriation and then again in the 1990s in order to assess their current state and identify the predictors of long-delayed symptom onset. The use of retrospective accounts is methodologically questionable by the possibility of memory biases — however, they are commonly used out of necessity.<sup>17</sup>

The current investigation uses longitudinal prospective and retrospective data from a sample of former East German political prisoners.<sup>18,19</sup> Main findings of the 1990s studies concerned the incidence of PTSD and other psychological conditions, as well as the role of trauma severity and initial reactions after detention. This constitutes the retrospective part. In the late 2000s, we were able to re-invite and interview the former sample again. This constitutes the prospective part of the study. This group of non-treatment seeking civil-rights activists assessed over a period of approximately 15 years after the fall of the Berlin Wall can be considered particularly valuable because of its uniqueness in the post-communist

Europe. The main focus of the current investigation is to empirically attain different long-term trajectories spanning retrospectively over approximately 25 years, and prospectively over another 15 years. Finally, we analyze the influence of selected pre-, peri-, and post-traumatic factors on these long-term trajectories to gain toeholds for more specific support or intervention for the survivors.

## Method

### *Sample and Procedure*

The sample of former East German political prisoners was first interviewed in 1995 (termed Time 1: T1),<sup>18</sup> on average 24 years ( $M=23.6$ ,  $SD=10.7$ ) after their release from prison, and was also invited to participate in a follow-up in 2008, on average 37 years after their release from prison (termed Time 2: T2). Interviews took place either in the research department of a university hospital in Dresden or, in the case of immobility, in participants' hometowns. Ethics Review Board approval was granted from the University of Zurich.

Of the 146 participants in the 1995 assessment, 25 were deceased in 2008, 17 declined further participation mainly due to

health impairments, 11 could not be located and seven provided only written assessments. Thus, there are 86 participants in the current study, i.e., the participation rate was 71% of the 121 surviving participants. In 2008, the participants' ages ranged from 40 to 85 years with a mean of 64.4 years.

Features of the sample at T1 and T2 are displayed in Table 1. In order to check if dropouts at T2 changed sample characteristics all data were entered into a logistic regression model (continuous variables z-transformed). Higher age was associated with dropout ( $OR=2.04$ , 95%;  $CI=1.15-3.62$ ) as well as lower education ( $OR=.36$ , 95%;  $CI=.14-.89$ ). Other sample characteristics did not vary significantly across the two measurement points.

The most recent assessment time-point T2 in 2008 revealed that 32.6% of the sample met criteria of PTSD and, in addition, 25.6% had partial PTSD ('partial' is used interchangeably with 'subsyndromal'<sup>20</sup>). Fourteen years earlier, at T1, 29.1% of the current sample met criteria of PTSD and 24.4% those of partial PTSD. Retrospective diagnoses for T0 (shortly after release) showed prevalence rates of 61.6% for PTSD and 20.9% for partial PTSD.

**Table 1.** *Characteristics of the former political prisoners sample*

	Sample at T1 (N=146)	Sample at T2 (n=86)
Age at time 1 in years: Mean (SD)	53.6 (11.9)	51.3 (10.3)
Gender: Male participants	125 (85.6%)	72 (83.7%)
Educational degree at time 1		
Lower than secondary school	110 (74.3%)	60 (69.0%)
Secondary school or higher degree	36 (25.7%)	26 (31.0%)
Interval in years between prison release and time 1: Mean (SD)	24.5 (11.3)	23.6 (10.7)
Duration of imprisonment in months: Mean (SD)	36.3 (37.2)	30.0 (29.2)

### *Measures*

PTSD and other psychiatric diagnoses were assessed at T1 and T2 by clinically experienced experts according to respective DSM-IV criteria in 1995 and 2008 with the structured “Diagnostic Interview for Psychological Symptoms”.<sup>21</sup> A retrospective PTSD diagnosis for the time after release (termed Time 0: T0) was assessed at T1 with the instruction: “Was this [symptom] present sometime in your first year after release from prison. If yes, for how long?” Symptom endorsements lead to diagnostic status assignment according to the DSM-IV algorithm for PTSD.

Comorbid disorders at T1 and T2 were assigned based on assessments by the same clinical interview. The clinical interview captures all affective, anxiety or somatoform disorders and a general diagnosis of substance use disorder.<sup>22</sup> In order to determine the number of comorbid disorders, the total number of DSM-diagnoses was summed accordingly (range 0 to 12).

Resilience was operationalized as being the lack of, or having only a few, PTSD symptoms, but was not measured by any psychological construct or assessment.

### *Predictors of trajectory classes*

The pre-traumatic variable Historic Era was structured based on the previously reported classification<sup>18</sup> (see short description in the background part above): 1st imprisonment era from 1949-1953 (worst living and legal conditions for political prisoners, physical and psychological torture), 2nd imprisonment era from 1954-1970 (intermediate conditions, physical and psychological torture), 3rd imprisonment era from 1971-1989 (somewhat improved conditions due to the Helsinki accord process; mainly psychological forms of torture). Age at traumatization was divided into developmen-

tally meaningful age groups: Youth (14-18 years); young adults (19-34 years), middle-aged adults (35-50 years).

Peri-traumatic variables were taken from the 1995 assessment by the persecution and maltreatment variables Trauma Severity and Initial Reactions<sup>18</sup> and were supplemented by Release Environment (to West Germany, i.e. predominant friendly reception; to East Germany, i.e. predominant adversarial reception).<sup>19</sup> Trauma severity values ranged from 0 to 6 with acceptable reliability. Initial Stress ranged from 0 to 10.

Post-traumatic variables: Treatment Received was assessed at T2 by asking participants if they had ever engaged in treatment for the symptoms they endorsed in the clinical interview after their release from prison. The response categories were as follows: pharmacotherapy, psychotherapy or other therapies (e.g. alternative medicine). The Treatment Received variable, the summation of the types of treatment received, was rated on a scale from 0 to 3. For the socio-interpersonal variables, previously validated measures with appropriate psychometric characteristics were used. The Social Support Scale (SSS),<sup>23</sup> is a standard instrument that assesses perceived instrumental and emotional support. Its values range from 0 (none) to 15 (utmost). The Disclosure Tendencies Questionnaire (DTS),<sup>24</sup> measures aspects of a person's intention to disclose traumatic experiences and consists of 3 subscales: reluctance to talk (13 items) assesses resistance to tell others about the trauma; urge to talk (11 items) assesses the victims' need to disclose the traumatic experiences; and emotional reactions during disclosure (10 items) assesses affective states while disclosing the trauma. Its sum score values range from -30 (never) to 30 (most often). Attitudes Towards Forgiveness Scale (ATF),<sup>25</sup> consists of 6

items that assessed the extent to which participants viewed forgiveness as a virtue or desirable characteristic regardless of the extent to which they themselves actually practice forgiveness. Its values range from 1 (never) to 7 (often).

All scales used during this study were tested and reported Cronbach alpha's between 0.71 to 0.94 indicating a moderate-excellent reliability.

#### *Statistical analysis*

The main analysis applies "Latent Class Growth Modelling" (LCGM), a recently developed statistical tool for comprehensive data analyses.<sup>26</sup> This method was chosen to explore possible subpopulations with specific trajectories within the study sample.<sup>26</sup> It simultaneously evaluates all measurement points submitted to the analysis, and produces fit statistics that allow testing for multiple class solutions. An individual's assignment to a particular sub-class was modelled by a categorical latent class variable with the specific growth curve within each class by latent variables (parameters: intercept, slope and quadratic term). Variances and co-variances of intercept, slope and the quadratic term were fixed at zero for the sake of model identification.

Accordingly, starting with a single trajectory class solution (e.g., total sample), increasing numbers of classes were tested until the model fit statistics indicated best fitting solution. For that purpose, the relative fit of different models was evaluated by the Lo-Mendell-Rubin adjusted likelihood ratio test (LMR-A<sup>27</sup>), the sample-size-adjusted Bayesian information criterion (BIC-A), and the Aikake information criterion (AIC<sup>28</sup>). A model is preferable over another model with the next lower number of classes when the LMR-A is significant while a non-significant LMR-A value indicates that the solution

includes too many classes, arguing for a solution with fewer classes. Other parameters being equal, models with lower BIC-A and AIC values are preferred. Finally, the entropy of each class solution was assessed, with higher entropy values indicating better fit than lower ones. The model selection, however, should not only be based on the fit of competing models but should also consider aspects of parsimony and theoretical assumptions. Specific parameters and fit indices of the different class solutions are described in the Appendix Table A. For the purpose of model identification, PTSD diagnoses status was subdivided into three categories: 0 = no PTSD, 1 = partial PTSD, and 2 = full PTSD with partial PTSD given to participants meeting the criterion for re-experiencing and either the criteria for avoidance or hyperarousal. The clinical justification for using "partial PTSD" status has been given by various authors; e.g., Schützwohl and Maercker<sup>22</sup> showed the concept of partial PTSD to be appropriate to differentiate higher distress compared to non-PTSD survivors.

Once the best fitting solution and the corresponding number of trajectory classes had been selected, we used class membership as the categorical dependent variable in a series of logistic regression models. Due to the relatively small number of members in some classes the influence of potential predictors on class membership was analyzed univariately with the respective trajectory class against all others. As described, potential predictor variables were grouped into pre-, peri- and posttraumatic variables. For controlling of multicollinearity we initially calculated intercorrelations of all predictor variables (see Table D in Appendix).

## **Results**

### *Trajectories and their prevalences*

Comparing model fit between a two-class, three-class, four-class, and five-class model, the four-latent class solution was selected. The Chi-Square statistics (14.71,  $df=10$ ,  $p=.14$ ) indicated a good replication of the data. Due to slightly higher Entropy (.84 versus .79) the five-class model would have to be numerically preferred over the four-class solution but, however, it was not superior to the four-class solution (LMR-A=9.20,  $p=.07$ ). Therefore, the four-trajectory classes solution was the best fit after an overall view on parameters (see Appendix Table A). An examination of latent class probabilities for the most likely latent class membership for a 4-class solution showed a clear separation between the trajectory classes (see Appendix Table B). Related estimated probabilities indicated similar courses (see Appendix Table C).

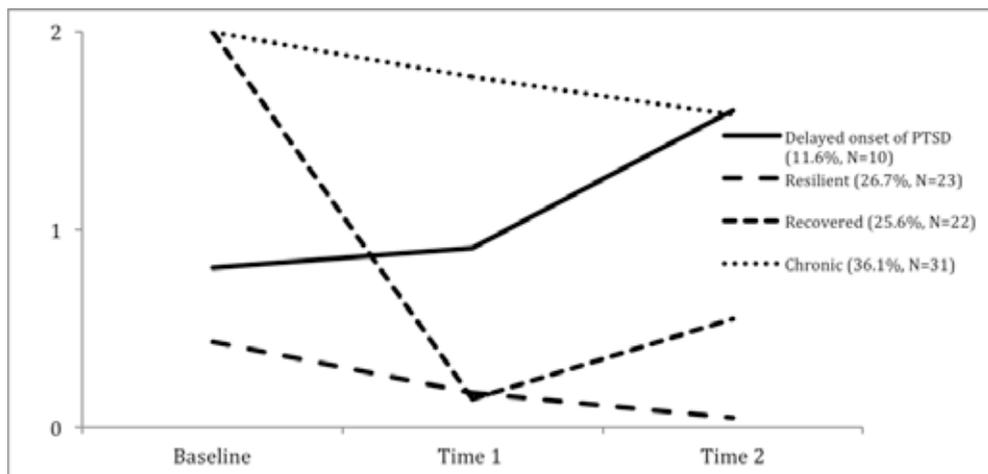
These four classes were labelled as follows and consisted of N persons: class 1=delayed onset of PTSD (N=10), class 2=resilient (N=23), class 3=recovered (N=22), and class 4=chronic (N=31). A

graphical illustration of these PTSD trajectories is given in Figure 1. As shown in Figure 1, the chronic class begins at high values with a slight decline across time and the resilient class parallels this development at a low level. The recovered class begins at the highest levels, declines sharply at T1 and slightly re-ascends but does not reach the full level of partial PTSD. The delayed class starts at moderate level of partial PTSD and increases in particular between T1 and T2.

#### *Predictors of PTSD trajectories*

As displayed in Appendix Table D none of the correlations across predictor classes exceeded  $r=.52$ . Thus, a regression analyses appeared appropriate. Significant associations between predictors were marked by an asterisk. Accordingly, from the pre-traumatic variables, higher education was significantly related to fewer chronic trajectories and more delayed trajectories. Latest historical era(s) of imprisonment was associated with

**Figure 1.** Trajectory classes of long-term trauma aftermath by Latent Class Growth Modelling



Note: Level of PTSD: 0 = no PTSD, 1 = partial PTSD, and 2 = full PTSD

fewer recovered trajectories. From peri-traumatic variables, trauma severity directly predicted the chronic trajectory. Release environment (East vs. West Germany) predicted delayed trajectory with a higher ratio for belonging to the delayed class when released to West Germany.

Table 2 shows the results of a series of logistic regressions. The four respective trajectory classes (chronic, recovered, delayed, and resilient) were predicted by four

pre-traumatic, four peri-traumatic and seven post-traumatic predictors (particular class against combined other classes). Some predictor variables failed to reach significance for any of the class predictions (e.g., age group at traumatization, gender, trauma duration, release environment [East vs. West Germany]).

When comparing the three predictor factor groups (pre, peri and post), post-traumatic variables were found most predictive

**Table 2.** Predictors of the four trajectory classes (ORs and 95% CIs given in brackets; respective trajectories are tested against combined other classes)

Predictors	Trajectory classes			
	Chronic	Recovered	Delayed	Resilient
<b>pre-traumatic</b>				
Age group at traumatization	.82 (.42-1.59)	.71 (.33-1.50)	1.76 (.69-4.49)	1.27 (.63-2.54)
Gender (female : male)	2.00 (.63-6.36)	.43 (.09-2.11)	1.33 (.25-7.07)	.71 (.18-2.81)
Higher educational level	.55 (.38-.80)*	1.18 (.85-1.63)	1.61 (1.01-2.58)*	1.21 (.87-1.67)
Historical era	1.96 (.91-4.23)	.38 (.16-.88)*	1.32 (.44-3.96)	1.03 (.47-2.27)
<b>peri-traumatic</b>				
Trauma severity	1.41 (1.07-1.87)*	.78 (.57-1.06)	1.10 (.70-1.73)	.82 (.61-1.09)
Initial stress reaction	1.22 (.94-1.59)	.96 (.76-1.21)	1.26 (.76-2.07)	.81 (.64-1.02)
Trauma duration	.99 (.98-1.01)	1.00 (.98-1.02)	1.01 (.99-1.03)	1.00 (.99-1.02)
Release environment	1.30 (.49-3.46)	.53 (.17-1.65)	2.4 (.63-9.21)	.77 (.24-2.46)
<b>post-traumatic</b>				
T1 No. of comorb. Disor.	2.17 (1.39-3.38)*	.55 (.32-.94)*	1.17 (.70-1.95)	.61 (.37-.98)*
T2 No. of comorb. Disor.	2.53 (1.51-4.26)*	.68 (.40-1.16)	1.39 (.83-2.32)	.12 (.03-.41)*
Treatment received	2.90 (1.65-5.09)*	.48 (.24-.95)*	1.12 (.54-2.31)	.45 (.23-.90)*
T1 Social support	.83 (.68-1.01)	1.14 (.91-1.42)	1.09 (.81-1.48)	1.05 (.85-1.30)
T2 Social support	.45 (.27-.76)*	2.98 (1.30-6.85)*	1.11 (.54-2.29)	1.15 (.68-1.95)
T2 Disclosure tendencies	1.01 (.98-1.04)	1.01 (.98-1.04)	.98 (.89-1.08)	.24 (.11-.53)*
T2 Forgiveness	.97 (.60-1.57)	1.15 (.67-1.97)	.50 (.24-1.04)	1.34 (.78-2.31)

\*) significant prediction, falling below or exceeding 1.0 confidence interval. Odds ratios below 1.0 indicate that this predictor contributed to decreased class membership (e.g., advanced/latest historical era predicted less membership of the recovered class); and ORs above 1.0 indicate that this predictor contributed to increased class membership (e.g., higher co-morbid conditions contributed to chronic class membership).

for all trajectory classes of PTSD. The number of co-morbid 12-months diagnoses at both times (T1 and T2) was strongly related to chronic trajectory. Furthermore, higher numbers of co-morbid disorders decrease the probability of belonging to resilient or recovered trajectories. In the chronic trajectory, there were, on average, 2.8 (SD=1.1) comorbid disorders of which the most common were specific phobias (37%), agoraphobia without panic (24%) and major depressive disorder, recurrent (16%). On the other hand, in the recovered trajectory there were .65 (SD=.20) comorbid disorders at T1 and .45 (SD=.15) at T2. Treatment received predicted positively for chronic trajectory membership and negatively for recovered or resilient trajectory membership. Higher social support at T2 predicted fewer cases of chronic trajectories and more cases of recovered trajectories. Furthermore, dysfunctional disclosure tendencies were related to lower probability for resilient trajectory.

From peri-traumatic factors, trauma severity directly predicted the chronic trajectory, i.e. trauma experienced more stressfully predicted it belonging to a chronic course.

## Discussion

This study had two aims, which will be discussed subsequently. Underlying the current study was the assumption that former political prisoners of a dictatorship, as in the case of the prior East German Democratic Republic, are a sample case to study the effects of long-term traumatic stress or torture.<sup>1-3</sup> The current study implemented a combined prospective and retrospective methodology spanning more than 35 years on average, which has also been adopted in other psychiatric studies.<sup>16,29</sup>

For the first research question which concerned the existence of long-time trajec-

tries, we investigated a recent typology of four trajectory classes: chronic, resilient, recovered, and delayed. Using Latent Class Growth Modelling (LCGM), these four classes were empirically found to be the best and most parsimonious solution. The most common class was the chronic course (36%), followed by the resilient (27%) and recovered (26%) as well as the delayed (12%) course classes. Thus, our study extends other findings in survivors of different trauma which, however, identified these classes across comparably shorter periods of time (i.e., one to one-and-a-half years) following the traumatic injury,<sup>11</sup> urban disasters,<sup>13</sup> cancer diagnosis<sup>30</sup> as well as in peacekeeping soldiers.<sup>12</sup>

When one compares the current results to previous findings with other survivor groups,<sup>30,31</sup> two differences appear: First, the recovered class showed a slight re-increase of PTSD symptoms, however, in the end, remained within the subsyndromal level. Given the specific age range of the sample of 64 years on average this finding can potentially be viewed as a typical pattern for elderly individuals who sometimes report the return of re-experiencing and other symptoms.<sup>16</sup> Second, the delayed class did not start with absence of symptoms but within the subsyndromal level and then became highly symptomatic, as described as a possibility for this course pattern by previous research.<sup>5</sup>

In more general terms, the current study provided further evidence that the course of PTSD does not remain stable over long periods of time.<sup>8,9,16,32,33</sup> Solomon<sup>33</sup> described this pattern as waxing and waning of PTSD symptoms. In the present study, more than a third (38%) of the traumatized changed their diagnostic group assignment. Concordantly, other studies have demonstrated between 21-50% change in PTSD samples.<sup>8,32</sup>

The second research question looked for reasons behind this instability over the time

course. We analysed predictors of the four trajectory classes in terms of pre-, peri- and post-traumatic factors. Previous studies<sup>7,12</sup> showed single predictors of these three classes (e.g., trauma severity, current comorbidity and current PTSD level) in a more unsystematic manner. Previous research has shown that factors that impact current life of the survivors, which we called 'post-traumatic' because they operated after the trauma, are the most common predictors of course followed by the pre-traumatic factors. In the sample of former political prisoners that we investigated, the post-traumatic variables, such as the amount of psychopathological load (co-morbid disorders, treatment utilization), as well as socio-interpersonal phenomena (social support, disclosure tendencies), also stood out as the most effective group of predictors as in previous research.

Regarding specific trajectories:

- The chronic course was characterized by less education, higher trauma dose, higher extent of co-morbid disorders, lower current social support, as well as receiving more therapeutic support. The latter finding indicates that those with more problems went to therapy, which probably related to their higher severity of traumatic experiences.
- The delayed course was characterized by only higher education. Higher education and intelligence have, so far, been viewed as protective factors for PTSD.<sup>14</sup> However, no longitudinal studies have investigated these factors and, therefore, the possibility of long-term conversion into a risk factor remains open. It is possible that with increasing age, the association between higher education and various life-span developmental factors interact (e.g., tendency to review one's own life,

develop embitterment<sup>34</sup>).

- The resilient trajectory had no pre- or peri-traumatic predictors, but four post-traumatic factors contributed: fewer comorbid disorders at T1 and T2, lower treatment utilization (i.e., probably because they exhibited lower symptoms from the outset), as well as reduced urge to currently disclose about the trauma. The latter interpersonal factor 'urge to disclose' to family and friends proved to be a sensitive predictor.<sup>15</sup> It can be viewed as an approximate measure that a person is able to integrate the memory of the trauma into his or her life-story.
- The recovered class was marked by fewer intermediate comorbid disorders and higher current social support. In addition, for the recovered group, an earlier historic context of traumatization during Stalinism (1950s) was also found to be a predictor. This may appear paradoxically since the imprisonment conditions were extremely hard including starvation and all sorts of torture.

To date, the influence of historic-cultural contexts has only rarely been investigated within the context of PTSD and torture. It remains open how these specific predictors are effective.<sup>15</sup> In the current study, the paradox effect may be explained by higher mortality of the most severely traumatized earlier prisoner cohorts, i.e. only the psychologically resilient persons of that era may have survived until today. Other historical-cultural contexts, unfortunately, remained out of the focus of the present study, i.e. contextual factors such as the discussions about the Stasi documentation and opening of registers, and questions regarding accountability of former state officials. These may have affected post-traumatic coping or completion at the side of the

survivors. The psychological variable of readiness for forgiving, which had been investigated in the present study, did not show any effect. Further research should focus on a more context-sensitive assessment of this phenomenon and its underlying processes.

Finally, the methodological limitations of the current study will be discussed. The study implemented a mixed retro- and prospective methodology. As known, memory-biases result in less reliable results, which in this study can refer to the assessment point of T0 (anchor: “during the first year following the end of imprisonment”). However, as other true prospective studies over 20-40 years<sup>8,9</sup> have demonstrated on converging results, we do not assume that this source of error is substantial. The use of the elaborated Latent Class Growth Modeling analyses provided some unique opportunities. However, some restrictions have to be acknowledged: The sample size was relatively small with regard to the fact that this method is usually based on large samples.

In addition, the current study did not utilize PTSD scores with full Likert scale ranges but instead just the three levels of full PTSD, partial PTSD and no PTSD in order to empirically create classes using LCGM. Despite these constraints, we consider the possibility to study our sample of victims of political persecution as a unique chance to shed more light on this under-investigated topic. We were able to re-assess more than 70% of the initial sample 14 years after baseline interview. Thus, in the light of a deeper understanding and insight into long-term outcomes of traumatization or torture, the value of the data greatly outweighs some methodological concerns.

Another limitation was that some of the predictors of the differentiation of trajectory classes were only assessed at the last time point, as these indicators were not available

in 1995. A further limitation which must be noted is the possible sample biases due to sample attrition from T1 to T2, which increased the proportion of older individuals with lower education. All results, therefore, must be interpreted with some caution for specificity biases of the particular sample.

Overall, the current study shows that a third of the participants changed their health status or diagnostic trajectory. This should be given more attention for diagnostic, legal, restitution, therapeutic, or rehabilitative purposes, especially for survivors of political persecution or torture. One of the many lessons learned from former political prisoners from East Germany is that, to attain the recovery or resilient trajectory, one is better off to use family or social support and to talk as frank and open as possible about what he or she went through.

#### References

1. Basoglu M. Torture and its consequences. New York: Cambridge University Press; 1998.
2. Maercker A, Schützwohl M, Solomon Z. Post-traumatic stress disorder. A lifespan developmental perspective. Seattle: Hogrefe & Huber; 1999.
3. Bauer M, Priebe S, Häring B, Adamczak K. Long-term mental sequelae of political imprisonment in East Germany. *J Nerv Ment Dis*. 1993;181(4):257-62.
4. Werkentin F. Recht und Justiz im SED-Staat. Bonn: Bundeszentrale für politische Bildung; 2000.
5. Andrews B, Brewin CR, Philpott R, Stewart L. Delayed-onset posttraumatic stress disorder: A systematic review of the evidence. *Am J Psychiatry*. 2007;164(9):1319-26.
6. Smid GE, Mooren TTM, van der Mast RC, Gersons BPR, Kleber RJ. Delayed posttraumatic stress disorder: Systematic review, meta-analysis, and meta-regression analysis of prospective studies. *J Clin Psychiatry*. 2009;70(11):1572-82.
7. Solomon Z, Dekel R. PTSD among Israeli ex-POWs 18 and 30 years after release. *J Clin Psychiatry*. 2005;66:1031-37.
8. Solomon Z, Mikulincer M. Trajectories of PTSD: A 20-Year Longitudinal Study. *Am J Psychiatry*. 2006;163(4):659-66.
9. Solomon Z, Horesh D, Ein-Dor T. The Longi-

- tudinal Course of Posttraumatic Stress Disorder Symptom Clusters Among War Veterans. *J Clin Psychiatry*. 2009;70(6):837-43.
10. Bonanno GA. Resilience in the Face of Potential Trauma. *Curr Dir Psychol Sci*. 2005;14(3):135-38.
  11. deRoon-Cassini TA, Mancini AD, Rusch MD, Bonanno GA. Psychopathology and Resilience Following Traumatic Injury: A Latent Growth Mixture Model Analysis. *Rehabil Psychol*. 2010;55(1):1-11.
  12. Dickstein BD, Suvak M, Litz BT, Adler AB. Heterogeneity in the course of posttraumatic stress disorder: Trajectories of symptomatology. *J Trauma Stress*. 2010;23(3):331-39.
  13. Nandi A, Tracy M, Beard JR, Vlahov D, Galea S. Patterns and Predictors of Trajectories of Depression after an Urban Disaster. *Ann Epidemiol*. 2009;19(11):761-70.
  14. Brewin CR, Andrews B, Valentine JD. Meta-Analysis of Risk Factors for Posttraumatic Stress Disorder in Trauma-Exposed Adults. *J Consult Clin Psychol*. 2000;68(5):748-66.
  15. Maercker A, Horn AB. A socio-interpersonal context model of PTSD: the case for environments and interpersonal processes. *Clin Psychol Psychother*. 2012.
  16. Port CL, Engdahl B, Frazier P. A Longitudinal and Retrospective Study of PTSD Among Older Prisoners of War. *Am J Psychiatry*. 2001;158(9):1474-79.
  17. Roemer L, Litz BT, Orsillo SM, Ehlich PJ, Friedman MJ. Increases in retrospective accounts of war-zone exposure over time: the role of PTSD symptom severity. *J Trauma Stress*. 1998;11:597-605.
  18. Maercker A, Schützwohl M. Psychological long-term effects of political imprisonment: A group comparison study. *Soc Psychiatry Psychiatr Epidemiol*. 1997;32:434-42.
  19. Maercker A, Beauducel A, Schützwohl M. Trauma severity and initial reactions as precipitating factors for posttraumatic stress symptoms and chronic dissociation in former political prisoners. *J Trauma Stress*. 2000;13(4):651-60.
  20. Maercker A G, Schützwohl M Trauma sequelae over 15 years in former political prisoners from East Germany (Traumafolgen-Verläufe über 15 Jahre bei ehemaligen politischen Inhaftierten der DDR). Zurich: Dept. of Psychology: Psychopathology & Clinical Intervention; 2012.
  21. Schneider S, Margraf J. DIPS-Diagnostisches Interview bei psychischen Störungen [Diagnostic interview for mental disorders]. 3 ed. Göttingen: Hogrefe; 2006.
  22. Schützwohl M, Maercker A. Effects of varying diagnostic criteria for posttraumatic stress disorder are endorsing the concept of partial PTSD. *J Trauma Stress*. 1999;12:155-65.
  23. Fydrich T, Sommer G, Brähler E. F-SozU: Fragebogen zur sozialen Unterstützung [SSS: Social support scale]. Göttingen: Hogrefe; 1999.
  24. Mueller J, Moergeli H, Maercker A. Disclosure and Social Acknowledgement as Predictors of Recovery From Posttraumatic Stress: A Longitudinal Study in Crime Victims. *Can J Psychiatry*. 2008;53(3):160-68.
  25. Brown RP. Measuring individual differences in the tendency to forgive: Construct validity and links with depression. *Pers Soc Psychol Bull*. 2003;29:759-71.
  26. Muthén B. Latent variable analysis: Growth mixture modeling and related techniques for longitudinal data. In: Kaplan D, editor. *Handbook of quantitative methodology for the social sciences*. Newbury Park, CA: Sage; 2004:345-68.
  27. Lo Y, Mendell NR, Rubin DB. Testing the number of components in a normal mixture. *Biometrika*. 2001;88:767-78.
  28. McLachlan GJ, Peel D. *Finite mixture models*. New York: Wiley; 2000.
  29. Kessler RC, McLaughlin KA, Green JG, Gruber MJ, Sampson NA, Zaslavsky AM, et al. Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. *Br J Psychiatry*. 2010;197:378-85.
  30. Hou WK, Law CC, Yin J, Fu YT. Resource Loss, Resource Gain, and Psychological Resilience and Dysfunction Following Cancer Diagnosis: A Growth Mixture Modeling Approach. *Health Psychol*. 2010;29(5):484-95.
  31. Bonanno GA, Ho SMY, Chan JCK, Kwong RSY, Cheung CKY, Wong CPY. Psychological resilience and dysfunction among hospitalized survivors of the SARS epidemic in Hong Kong: A latent class approach. *Health Psychol*. 2008;27(6):659-667.
  32. Solomon Z, Shklar R, Mikulincer M. Frontline Treatment of Combat Stress Reaction: A 20-Year Longitudinal Evaluation Study. *Am J Psychiatry*. 2005;162(12):2309-14.
  33. Solomon Z, Mikulincer M. Posttraumatic intrusion, avoidance, and social functioning: A 20-year longitudinal study. *J Consult Clin Psychol*. 2007;75(2):316-24.
  34. Maercker A. Alterspsychotherapie: Entwicklungspsychologische Aspekte der Persönlichkeit, Psychopathologie und Methodik der Psychotherapie mit Älteren. In: Hiller W, Leibing E, Leichsenring F, Sulz SS, editors. *Lehrbuch der Psychotherapie, Bd. 1*. München: CIP-Medien; 2004.

# Appendix

**Table A.** Parameters of four subsequential Latent Class Growth Models

	2 classes	3 classes	4 classes	5 classes
Estimated parameters	8	12	16	20
Chi2 (df, p-value)	34.18 (18, .01)	23.66 (14, .05)	14.71 (10, .14)	12.57 (6, .05)
Log-Likelihood	-242.58	-238.18	-233.61	-231.79
LMR-A (value, p-value)	40.35 (.054)	8.34 (.064)	10.58 (.045)	9.20 (.074)
adjusted BIC	495.56	491.95	488.01	489.57
AIC	501.16	500.36	499.22	503.59
Entropy	0.67	0.67	0.79	0.84

**Table B.** Average Latent Class Probabilities for Most Likely Latent Class Membership (Row) by Latent Class (Column)

	Delayed	Resilient	Recovered	Chronic
Class 1	0.981	0.019	0	0
Class 2	0.041	0.959	0	0
Class 3	0.060	0.066	0.837	0.036
Class 4	0.081	0.001	0.031	0.886

**Table C.** Mean posterior probabilities of class-membership of 4 class solution

	Baseline	Time 1	Time 2
Class 1	0.258	0.152	0.590
Class 2	0.062	0.015	0.002
Class 3	1	0.014	0.061
Class 4	1	0.811	0.627

**Table D.** Testing for multicollinearity for predictor analysis: Associations among pre-, peri-, and post-traumatic predictor variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Pre-traumatic																	
1. Age group at traumatization [youth, young & mid adulthood]	--	--	-														
2. Gender [m=1, f=2]	--	--	.17	-													
3. Higher educat level [no=0, yes=1]	--	--	.21*	-.03	-												
4. Historical era [1st to 3rd]	--	--	.27**	.30**	.03	-											
Peri-traumatic																	
5. Trauma severity	4.67	1.97	-.05	-.14	-.15	-.11	-										
6. Initial stress reaction	8.30	2.14	-.18	.05	.03	-.04	.10	-									
7. Duration of trauma [months]	30.02	29.21	-.04	-.26*	-.03	-.51***	.52***	-.05	-								
8. Release environment [East=1, West=2]	--	--	.33**	.24*	.13	.33**	.07	.04	-.02	-							
Post-traumatic																	
9. T1 No. of comorbid disorders	1.21	1.28	.06	.35**	-.14	.11	.12	.31**	.04	.11	-						
10. T2 No. of comorbid disorders	.88	1.11	.03	.39**	-.21	.13	.19	.25*	-.01	.12	.43***	-					
11. Treatment received [0 to 3]	.72	.89	-.02	.35**	-.15	.13	.21	.32**	-.04	.00	.41***	.51***	-				
12. T1 Social support	11.15	2.33	-.10	.06	.10	-.28**	.05	-.08	.16	-.03	-.21	-.20	-.24*	-			
13. T2 Social support	11.87	2.56	-.20	-.06	.03	-.26*	-.17	-.09	.05	-.08	-.46***	-.37***	-.33**	.68***	-		
14. T2 Disclosure tendencies	4.36	14.72	.08	.16	-.09	.05	-.07	.06	-.08	.06	.20	.12	-.01	-.06	-.25*	-	
15. T2 Forgiveness	4.13	.93	.00	-.10	.05	-.04	.01	-.04	.02	-.05	-.07	-.32**	-.12	.18	.28**	-.31*	-

Note: numbers printed in Italics are based on Spearman rank correlations; \* p ≤ .05. \*\* p ≤ .01. \*\*\* p ≤ .001