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Surviving early childhood trauma : effects of the holocaust on survivors' psychological and physiological well-being

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CHAPTER 3

Aftermath of Genocide:

Elevated Levels of Diurnal Cortisol in
Holocaust Survivors but not in their Adult
Offspring?

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Abstract

The Holocaust is the primordial example of a traumatic genocide. Here the effects of the Holocaust on diurnal cortisol secretion in survivors and their adult offspring are examined, and moderation by level of dissociative symptoms is tested. Careful matching of female Holocaust survivors and comparison participants living in Israel was employed to form a case-control study design with two generations, including 32 Holocaust survivors, and 33 comparisons, and their offspring (total $N = 144$). Participants completed measures of dissociation and physical health, and their salivary cortisol levels were assessed at six time points during a day. Holocaust survivors showed higher levels of daily cortisol secretion compared to the matched controls. Their offspring showed lower diurnal cortisol secretion but only when their surviving parents displayed more dissociation. Holocaust traumatization can get under the skin, in the first generation of survivors, and maybe also in their offspring.

Introduction

The Holocaust is the primordial example of a traumatic genocide, and the study of its long-term and intergenerational consequences may shed light on the detrimental effects of recent genocides in Cambodia, Nigeria, Rwanda, Sudan, and former Yugoslavia, just to name a few (Danieli, 1998). From various studies we know that the Holocaust negatively influences mental health of the survivors. Less is known about the way the Holocaust gets ‘under the skin’ and how it affects neurobiological functioning of the survivors and their offspring. Here we examine the effects of the Holocaust on diurnal cortisol secretion as an index for the functioning of the stress regulatory system.

The Holocaust was a devastating genocide and more than half a century after its closure survivors of this extreme trauma still show numerous signs of mental health problems, in particular post traumatic stress symptoms. In a recent meta-analysis on 71 samples with 12,746 participants, Holocaust survivors were less well-adjusted. In particular, they showed substantially more posttraumatic stress symptoms. They did not lag, however, much behind their comparisons in several other domains of functioning (i.e. physical health, stress related measures, and cognitive functioning), showing remarkable resilience (Barel, Van IJzendoorn, Sagi-Schwartz, & Bakermans-Kranenburg, 2010).

The resilience of the first generation of survivors might have been the cause of the unexpected absence of intergenerational transmission of trauma to offspring in the second and the third generation. In a quasi-experimental study on a non-select sample of survivors (grandmothers), their daughters, and their grandchildren, parenting style of first generation survivors was compared to carefully matched control subjects, and no differences were found (Sagi-Schwartz et al., 2003). The same was the case for the observed parenting of the second generation mothers to their offspring, the grandchildren of the survivors. In two separate meta-analyses the finding of non-transmission of trauma to the next generations was confirmed (Van IJzendoorn, Bakermans-Kranenburg, & Sagi-Schwartz, 2003; Sagi-Schwartz, Van IJzendoorn, & Bakermans-Kranenburg, 2008). Secondary traumatization emerged only in studies on clinical participants, who were stressed by the occurrence of serious psychological or physical illnesses such as severe combat reaction (Solomon, Kotler, & Mikulincer, 1988) or breast cancer (Baider et al., 2000). Taken together the meta-analyses on secondary and tertiary traumatization document a remarkable resilience of profoundly traumatized survivors in their (grand-)parental roles.

Under the skin? Appearances may be deceiving, however. Below the seemingly unruffled surface of more or less adequate adaptation to post-war conditions, traumatized individuals and their offspring might be more vulnerable to stressful

circumstances as a consequence of a somewhat dysregulated neurobiological stress system. The cortisol hormone is a product of the Hypothalamic-Pituitary-Adrenal (HPA) system that regulates physiological stress. Cortisol is released as a result of an organism's interaction with the environment, in particular in response to novelty and stress (Gunnar, 1994; Kirschbaum, & Hellhammer, 1994). In normal situations, production of cortisol follows a diurnal rhythm with high levels at awakening, an increase in secretion shortly after awakening, followed by a decline throughout the day (Kirschbaum, & Hellhammer, 1994; Watanabe, Donzella, Kertes, & Gunnar, 2004). This diurnal rhythm in cortisol levels is relatively stable in adults, but early in life the maturing HPA system is vulnerable to dysregulation through early experiences of deprivation or trauma, as documented in both animal models (Meaney, 2001) and human infants (Dobrova-Krol, Van IJzendoorn, Bakermans-Kranenburg, Cyr., & Juffer, 2008; Gunnar, Morison, Chisholm, & Schuder, 2001).

However, dysregulation of the HPA-axis might imply elevated levels of cortisol secretion during the day (hypercortisolism) as well as lowered levels of cortisol production (hypocortisolism), and it still is unclear why studies on the consequences of severe trauma show deviations of the normal pattern in two diverging directions. In a small but pioneering study of second-generation Holocaust survivors, (Yehuda, Schmeidler, Wainberg, Binder-Brynes, and Duvdevani (1998) found lower levels of the stress hormone cortisol compared to a matched group of participants without a Holocaust background. Lower levels of cortisol were interpreted to indicate hypersensitivity to stress as a consequence of previous trauma. Yehuda et al. (1998) found that suffering from PTSD by the survivor was associated with significantly elevated risk of dysregulation of the HPA-axis functioning in themselves as well as in their adult offspring. In particular, adult offspring of mothers who survived the Holocaust and who were struggling with PTSD showed lowered levels of cortisol secretion compared with offspring without parental PTSD (Yehuda et al., 1998). Yehuda et al. (1998) speculated that alterations in daily cortisol levels were acquired via glucocorticoid programming either from in utero exposures or in response to maternal behaviors early in life. In a larger study on Holocaust survivors Yehuda and her team (Yehuda, Morris, Labinsky, Zemelman, & Schmeidler, 2007) recently found also reduced total glucocorticoid production in Holocaust survivors independent of PTSD.

Severe trauma may also create increased propensity to dissociate as a coping mechanism (Yehuda, Bierer, Ruth, Schmeidler, & Seckl, 2009). Dissociation is usually defined as a failure to integrate experiences (memories, perceptions, etc.) (Kennedy et al., 2004). It may involve a variety of symptoms such as amnesia, depersonalisation, derealisation and identity confusion, and it is speculated that these processes reduce awareness of intolerable information about earlier traumatic

experiences. The link of dissociation with traumatic events is well-established (Kennedy et al., 2004), and because dissociation is a correlate of various psychological disorders it has been suggested as the mechanism that explains the relation between early trauma and later psychopathology (Putnam, 1985; Van der Kolk, McFarlane, & Weisaeth, 1996). In a study on the sequelae of the World Trade Center (WTC) attack, Simeon et al. examined dissociation, PTSS, and basal cortisol in a small sample of highly exposed adults and healthy controls (Simeon, Yehuda, Knutelska, & Schmeidler, 2008). They found that after nine months dissociation was associated with greater peritraumatic dissociation and with childhood trauma, and lower cortisol levels in the morning. Dissociation was a more sensitive correlate of basal cortisol than post traumatic stress symptoms.

Here we hypothesize that Holocaust survivors show different levels of daily cortisol compared to matched controls. Differences in mental health between adult offspring of survivors and comparisons have not been found in non-clinical, non-select studies thus far, but differences might be hidden under the skin, in dysregulated HPA-axis functioning. Thus, we hypothesize that adult offspring of Holocaust survivors also show dysregulated daily patterns of cortisol secretion compared to matched controls. Furthermore, the Holocaust effects might be moderated by dissociation, in the first as well as the second generation of survivors. Lastly, we explore the intergenerational transmission of basal cortisol secretion from the survivor generation to their adult offspring.

Method

Participants

Participants were recruited from population-wide demographic information provided by the population registry administered by Israeli Ministry of the Interior (Sagi-Schwartz et al., 2003). Two groups were compared: The first generation females had experienced the Holocaust in their childhood and were selected if they had at least suffered the loss of both parents due to the Holocaust. Their daughters (the second generation) were included if they had at least one child in the age of 12 months (the third generation, not part of this report). The matched comparison group of first generation females were born in Europe and immigrated to Israel just before the Holocaust. They were selected if they had a daughter (the second generation) with at least one child aged 12 months (Sagi-Schwartz et al., 2003).

For the purpose of the current phase of the study, we contacted the 106 first-generation participants and 104 second-generation participants of the original study. Ten first-generation participants (9.3%) had passed away, 13 (11.5%) had health problems (such as dementia) that prevented them from cooperating, two

(1.9%) had personal problems (such as mourning), and two (1.9%) could not be located. Of the 79 first-generation participants who were able to cooperate, 65 (82.3%) agreed to take part in the study (32 Holocaust survivors, and 33 comparison respondents). The age of the first generation ranged from 71 to 84 years ($M=76.98$, $SD=2.99$). Of the 104 second-generation participants, five (4.7%) had moved out of Israel, one (0.9%) had health problems and two (1.9%) could not be located. Of the remaining sample, 79 (82.3%) agreed to take part (47 daughters of Holocaust survivors group, and 32 daughters of comparison subjects). The age of the second generation ranged from 38 to 59 years ($M=47.46$, $SD=4.41$). For 58 first-generation participants and for 74 second-generation participants complete data on daily cortisol secretion was available.

Procedure

Research assistants visited each participant at home at the participant's convenience. The first and second generation participants were visited on separate occasions. After a brief introduction, the participant signed an informed consent form and completed some questionnaires. Participants were guided by the research assistant through the whole session.

Measures

Dissociation. The Dissociative Experiences Scale (DES) was developed by Carlson and Putnam to assess the frequency of dissociative experiences (Carlson, & Putnam, 1993). It contains 28 self report items that ask participants to indicate the frequency (0%-100%) of various dissociative experiences (see for a meta-analysis on reliability and validity of the DES, Van IJzendoorn, & Schuengel, 1996). Translation into Hebrew was done by Hebrew and English native speakers, using a dual-focus approach in order to maintain linguistics equivalence (Peña, 2007). Total scale scores were calculated by averaging the 28 items scores, resulting in a scale score ranging from 0 to 100. Cronbach's alpha reliability coefficients were .86 for grandmothers, and .83 for mothers. A median split was computed to create a dichotomous dissociation factor.

Physical health. Physical health status was assessed by a questionnaire developed by Herczeg Institute on Aging (Tel Aviv University) and used in a previous Holocaust study (Van der Hal-Van Raalte, Bakermans-Kranenburg, & Van IJzendoorn, 2008). Subjects were asked to rate their health using a 5-point Likert scale ranging from 1=*very unhealthy* to 5=*very healthy*. Also, they were asked to indicate which of 19 listed health problems they suffered. Participants could add more health conditions if they wanted. The total number of health problems ranged from 0 (no health problems) to 15 for grandmothers, and from 0 to 8 for mothers. This questionnaire is widely used for socio-demographic research in

Israel. The correlation between the two health measures was $r = .60$ ($p < .01$) for the first generation, and $r = .41$ ($p < .01$) for the second generation.

Cortisol levels. Participants' daily cortisol secretion was measured by assessing their salivary cortisol levels at six points of time during a regular day. Based on Strazdins et al.'s findings (Strazdins et al., 2005), regular tubes were used without any stimulants. During the home visit participants received sampling kits including the material needed for collection and detailed written instruction how to obtain the samples, which were also elaborated face to face. Participants were asked to collect saliva six times: immediately after awakening, half an hour after awakening, an hour after awakening, before lunch time, before dinner, and before bedtime. Research staff telephoned the participants the day before the observation day to remind them of collection. Mean cortisol sampling times for the first generation were 6:58AM ($SD=0:51$), 7:31AM ($SD=0:55$), 8:01AM ($SD=0:57$), 13:01 PM ($SD=1:03$), 19:13 PM ($SD=0:40$), and 22:44 PM ($SD=1:03$). Mean cortisol sampling times for the second generation were 6:52AM ($SD=0:59$), 7:22AM ($SD=0:59$), 7:55AM ($SD=1:01$), 13:25 PM ($SD=1:01$), 19:31 PM ($SD=0:57$), and 23:15 PM ($SD=1:01$). Participants were not allowed to eat or drink anything but water at least 30 minutes before sampling. Samples were stored at -18°C until being assayed by the Research Center for Psychobiology at the University of Trier.

Cortisol was assayed using a time-resolved fluorescence immunoassay. The intra-assay coefficient of variation of this immunoassay was between 4.0% and 6.7%, and the corresponding inter-assay coefficients of variation were between 7.1% and 9.0%. Samples were run in duplicate and mean values were calculated for each sample. The detection limit for cortisol ranged from 0.1-100 nmol/L. More than 99% of salivary cortisol measures were within this assay detection limit. Samples lower than 0.1 nmol/L and higher than 100 nmol/L were coded as missing because of their impossible values. Missing samples were only imputed for participants who had maximally two missing samples per day.

Statistical Analyses

Cortisol measures were inspected for outliers, which were defined as values with greater than 3.29 SD above the mean. Because the distributions of cortisol measurements were positively skewed, \log_{10} transformations were used for analysis. By means of trend analysis, outliers were made to fit in the specific curve of the individual respondent. Cortisol diurnal patterns were analyzed by multivariate analyses of variance with repeated measures (the participants' cortisol levels at six time points), with group (Holocaust survivors versus comparisons) as between-subject factor, and educational level as covariate. In analyses on the moderating role of dissociation, the median split dissociation variable was included as a second factor. Analyses of covariance were conducted to test differences between the

groups in total cortisol production over the day, using the Area Under the Curve with respect to ground (AUCg, Pruessner, Kirschbaum, Meinlschmid, & Hellhammer, 2003). To explore intergenerational transmission of total daily cortisol production a repeated analysis of covariance was used with generation as a within-subject factor, and group as a between-subject factor.

Results

First generation. Table 1 presents the background variables and the untransformed cortisol levels during a day at home, for first generation Holocaust survivors as well as first generation comparisons. Holocaust survivors had significantly fewer years of education than the comparison group, $t(56) = -4.50$, $p < .01$, and they reported more dissociative experiences than their comparisons, $t(56) = 2.40$, $p = .02$. After log-transformation, analyses of cortisol levels were performed using a 2 (Group: Holocaust versus comparisons) by 6 (time of day) repeated measures analysis of variance with educational level as covariate. There was a significant main effect of time of day, demonstrating declining cortisol levels throughout the day, $F(5,51) = 7.17$, $p < .01$, $\eta^2 = .41$. A main effect of group was detected, $F(1,55) = 6.10$, $p < .02$, $\eta^2 = .10$, and no significant interaction effects were present, $F(5,51) = 0.40$, $p = .85$, $\eta^2 = .04$. As shown in Table 1, cortisol levels of Holocaust survivors were higher across all time points compared to the levels of the comparison subjects.

Table 1. *Background Variables and Cortisol Values over the Day, First Generation*

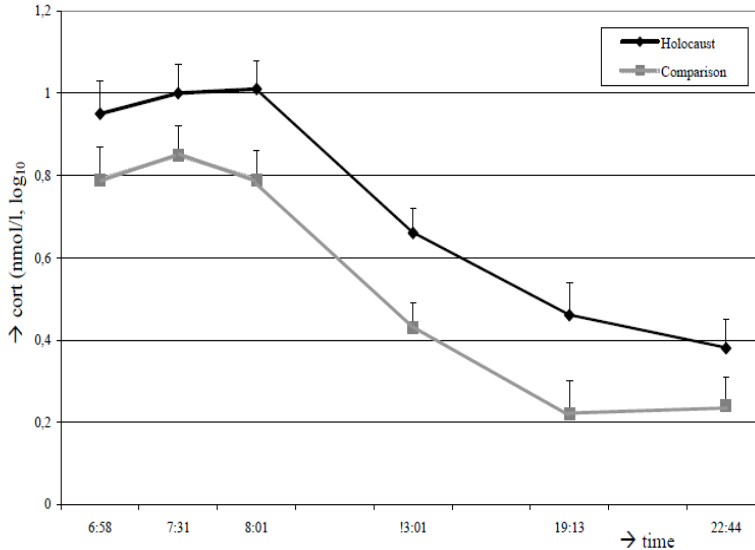
	Holocaust (<i>n</i> = 29)		Comparison (<i>n</i> = 29)	
	M	SD	M	SD
age	77.1	3.44	76.8	2.35
years of education	5.1**	3.46	8.7	2.67
number of children	3.2	0.95	3.4	1.35
family status: married/ widowed	17 / 12 ¹		22 / 7	
perceived health	3.38	1.05	3.58	0.99
number of health problems	5.97	2.96	4.76	3.08
medication	21		23	
dissociation (DES)	0.32*	0.90	-0.27	0.98
cortisol time 1 (awakening) ²	0.93	0.42	0.81	0.39
cortisol time 2	0.98	0.33	0.87	0.35
cortisol time 3	0.98	0.32	0.83	0.37
cortisol time 4	0.61	0.31	0.48	0.26
cortisol time 5	0.40	0.40	0.27	0.37
cortisol time 6 (bed time)	0.39	0.35	0.27	0.34
total cortisol production (<i>AUC_g</i>)	1.05	0.26	0.94	0.25

* $p < .05$, ** $p < .01$

Notes. ¹ $n = 1$ separated, family status was not significantly different, $p = .16$. ²Cortisol values logtransformed.

Also, the *AUC_g* differed between the two groups, the analysis of covariance was significant, $F(1,55) = 7.22$, $p = .01$, $\eta^2 = .12$. Figure 1 shows the daily curves for the two first generation groups.

Figure 1. *Cortisol Levels over the Day (nmol/l, \log_{10} transformed) of First Generation Holocaust Survivors and Comparisons*



In order to examine the moderating role of dissociation, high or low dissociation (median split) was included as factor in the repeated measures analysis of variance; the three-way interaction between time, group, and dissociation yielded $F(5,49) = 0.76$, $p = .59$, $\eta^2 = .07$. The same analysis on AUCg showed a similar non-significant interaction ($p = .06$). In the Holocaust group the correlation between the continuous dissociation scale and total cortisol secretion was $r(28) = .07$, $p = .70$, showing that elevated levels of dissociation were not associated with deviating cortisol levels.

Second generation. In Table 2 the background variables and log-transformed cortisol data are shown for the second generation. No significant differences between the groups were found. Analyses of cortisol levels were performed using a 2 (Group: Holocaust offspring versus comparisons) by 6 (time of day) repeated measures analysis of variance with educational level as covariate. There was a significant main effect of time of day, demonstrating declining cortisol levels throughout the day, $F(5,67) = 5.79$, $p < .01$, $\eta^2 = .30$. The main effect of group was not significant, $F(1,71) = 0.03$, $p = .86$, $\eta^2 = .00$, and no significant interaction effects were present, $F(5,67) = 1.11$, $p = .36$, $\eta^2 = .08$ (see Table 2).

Table 2. *Background Variables and Cortisol Values over the Day, Second Generation*

	Holocaust (<i>n</i> = 45)		Comparison (<i>n</i> = 29)	
	M	SD	M	SD
age	47.5	4.19	48.0	4.77
years of education	10.7	2.44	11.6	2.31
number of children	3.2	1.25	4.0	2.51
family status: married / divorced	42 / 3 ¹		25 / 4	
perceived health	4.33	0.79	4.32	0.95
number of health problems	1.20	1.44	1.03	1.40
medication	13		5 ²	
dissociation (DES)	-0.05	0.97	-0.08	1.02
cortisol time 1 (awakening) ³	0.92	0.28	0.91	0.29
cortisol time 2	1.01	0.29	1.07	0.24
cortisol time 3	0.90	0.29	0.97	0.26
cortisol time 4	0.51	0.27	0.50	0.27
cortisol time 5	0.11	0.37	0.18	0.35
cortisol time 6 (bed time)	0.17	0.38	0.05	.36
Total cortisol production (AUC _g)	1.32	0.22	1.34	.25

* $p < .05$, ** $p < .01$

Notes. ¹ $n = 2$ single. ² $n = 28$. ³Cortisol values logtransformed

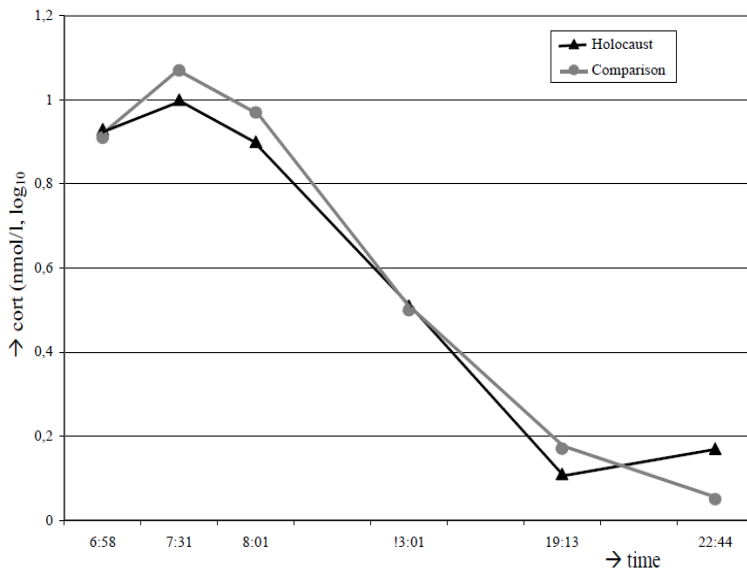
Also, the AUC_g did not differ between the two groups, the analysis of covariance was not significant, $F(1,71) = 0.15$, $p = .70$, $\eta^2 = .00$. Figure 2 shows the daily curves for the two second generation groups.

In order to examine the moderating role of dissociation, high or low dissociation was included as factor in the repeated measures analysis of variance; the three-way interaction between time, group, and dissociation yielded a non-significant $F(5,65) = 1.67$, $p = .16$, $\eta^2 = .11$. The same analysis on AUC_g showed similar non-significant results ($p = .63$). In the Holocaust offspring group the correlation between the continuous dissociation scale and total cortisol secretion

was $r(44) = -.11$, $p = .46$. Dissociation was not associated with cortisol level in the Holocaust offspring group.

Intergenerational transmission? In order to explore the transmission of cortisol production across the two generations of grandmothers and mothers a repeated measure analysis of covariance on area under the curve was conducted, for $n=42$ complete dyads ($n=24$ Holocaust, and $n=18$ comparisons). Generation was included as within-subject factor, and group (Holocaust versus comparison) as between-subject factor, with educational level of the first generation as a covariate. We found a significant effect for generation, $F(1,39) = 10.87$, $p < .01$, $\eta^2 = .22$, indicating that the second generation had higher values for total cortisol production across the day. There was no significant interaction between group and generation, $F(1,39) = 2.02$, $p = .16$, $\eta^2 = .05$.

Figure 2. *Cortisol Levels over the Day (nmol/l, \log_{10} transformed) of Second Generation Holocaust Survivors and Comparisons*



However, exploring the influence of dissociation (median split) in the first generation of Holocaust survivors on cortisol levels in the second generation, we found a lower level of cortisol production (AUCg) for second generation offspring of survivors with higher scores on dissociation. The interaction between group and

dissociation in the first generation was significant, $F(1,42)= 4.44, p= .04, \eta^2= .10$. Higher dissociation in the first generation Holocaust survivors was associated with lower AUC_g in the second generation ($M=1.27, SD=0.16, n=17$) compared to offspring of Holocaust survivors with lower dissociation ($M=1.39, SD=0.17, n=10$), $t(25)= 1.80$, one-tailed $p= .04$ (effect size $d= 0.73$).

Discussion

Holocaust survivors who immigrated to Israel after the Holocaust showed elevated levels of daily cortisol secretion compared to matched controls who immigrated with their parents to Israel just before the onset of the Holocaust. Their adult offspring, however, did not display a different diurnal cortisol pattern compared to offspring of the matched controls. Dissociation was not associated with cortisol production in the first or second generation. However, exploring a moderating role of dissociation we found a lower level of cortisol production for second generation offspring of survivors with higher scores on dissociation.

Elevated daily cortisol in Holocaust survivors is consistent with a previous study on late-life implications of early traumatic stress for the adreno-cortical system in a large non-convenience sample of child survivors of the Holocaust (Van der Hal-Van Raalte, Van IJzendoorn, & Bakermans-Kranenburg, 2007). In studies conducted on Holocaust survivors and matched comparisons, Yehuda and her colleagues (Yehuda, Halligan, Grossman, Golier, & Wong, 2000; Yehuda, Golier, & Kaufman, 2005; Yehuda et al., 1998) however found lower levels of daily cortisol. This discrepancy might be explained by differences in sampling. In Yehuda et al.'s studies survivors were living in the USA, whereas our study was conducted with survivors and comparisons living in Israel, with a multitude of stressors and potential traumatic events after the Holocaust (that were similar for both survivors and comparisons). The chronic stress in post-war Israel on top of the severe traumatic stress during the Holocaust might have caused a different daily cortisol pattern in the Israeli Holocaust survivors.

With regard to the second generation, we interpreted the absence of meta-analytic evidence for secondary traumatization in terms of the biopsychological stress-diathesis model that Paris (Paris, 2000) proposed. For the second generation survivors living in Israel with so many other survivors and their offspring social support might have been readily available (Van IJzendoorn et al., 2003). One important exception was the greater vulnerability of the second generation for major disasters such as suffering from a life-threatening illness (cancer, Baider et al., 2000) or being exposed to potentially fatal combat (Solomon et al., 1988). In the current study we may have found one of the causes of this heightened vulnerability

in stressful circumstances. In adult offspring of Holocaust survivors showing elevated levels of dissociation, we found lower daily cortisol production, converging with Yehuda et al.'s earlier finding on PTSS (Yehuda et al., 2005). Dissociation in parents has been documented to disturb children as they cannot understand its causes, and it is an important precursor of disorganized attachment. Hesse and Main labeled the conflict arising from dissociative parenting behavior as 'fright without solution' because the parent is at the same time attachment figure as well as sometimes unexpectedly showing frightening dissociative behavior (Hesse, & Main, 2006; see for a meta-analysis confirming this model, Madigan et al., 2006).

Holocaust survivors showed more dissociation than their comparisons. This concurs with studies on disasters like the Oklahoma City bombing (North et al., 1999) and a San Francisco earthquake (Cardena, & Spiegel, 1993). Dissociation did seem to serve as a moderator of intergenerational transmission of daily cortisol production. If the first generation was more dissociative, the second generation showed lower cortisol levels. This is not inconsistent with a small study by Simeon and colleagues on 21 adults highly exposed to the World Trade Center attack and 10 healthy controls without major exposure. Nine months after the attack no differences in daily cortisol were found, but within the exposed group more dissociation was related to lower cortisol levels in the morning (Simeon, Yehuda, Knutelska, & Schmeidler, 2008). Of course, the one-shot, single traumatic experiences around major disasters like the Oklahoma City bombing, an earthquake, or the World Trade Center attack differ drastically from the persistent trauma of the Holocaust starting years before the onset of the Second World War with subtle social exclusion and political discrimination, to the years of return after the end of the war, with an indifferent and sometimes hostile receiving society (Sagi-Schwartz et al., 2003; Keilson, 1979).

A limitation of the current study is the sampling of cortisol on only one day as sampling on more days would have created more reliable data. It should be noted however that the one-day sampling does not affect comparisons across Holocaust and comparison groups. The current study was limited to female survivors and their female offspring. In a previous study some evidence was found for greater vulnerability of male survivors for mental health problems due to the Holocaust (Van der Hal-Van Raalte et al., 2008), and replication on a male or mixed-gender sample is needed.

In sum, Holocaust survivors show higher levels of daily cortisol production and they transmitted this dysregulated stress regulatory system to the next generation only when they showed higher levels of dissociation. Primary traumatization gets under the skin, at least in genocidal traumas, but secondary traumatization seems restricted to those adult children who experienced parents with more intense levels of dissociation.

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