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# Sense of Coherence Moderates Late Effects of Early Childhood Holocaust Exposure



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This study evaluated child Holocaust survivors with an emphasis on potential protective factors facilitating participants' adaptation to post-Holocaust life. We examined Antonovsky's (1979, 1987) salutogenic paradigm, testing the mediating and moderating effect of participants' sense of coherence (SOC) on the association between early childhood deprivation due to Holocaust persecution and posttraumatic stress later in life. The nonclinical sample, composed of 203 child Holocaust survivors born between 1935 and 1944 completed questionnaires on Holocaust survival exposure, inventories on current health, posttraumatic stress, and SOC. The results indicated that SOC moderates the association between traumatic experiences during the war and posttraumatic stress, and SOC acts as a protective factor, buffering the impact of traumatic Holocaust experiences on child survivors in old age. Survivors with a less coherent perspective on the meaning of their life showed greater vulnerability for posttraumatic complaints. The moderating role of the SOC may suggest promising avenues of therapeutic interventions for child Holocaust survivors and other

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This research was supported by grants from The Levi Lassen Foundation, The Netherlands; ELAH—Center for Psycho-Social Counseling for émigrés of Dutch origin and their families, Israel; the Dutch governmental and Israeli Chapters of the Maror-Funds Foundation. Principal Investigator: Daniel Brom, PhD, Research Coordinator: Elisheva van der Hal-van Raalte, MA. The authors would like to thank the participants of the Infant Survivors of the Holocaust Study for their dedicated participation. We gratefully acknowledge the project's steering committee for their advice and the research assistants, especially Mina Dasberg, Tamar Freed, and Yamima Gottlieb, for their commitment to the project.

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Keywords: holocaust; sense of coherence; trauma; Post-Traumatic Stress Diagnostic Scale; war

In the past few decades, the study of trauma survivors has been dominated by a pathogenic approach, emphasizing the accumulation of risk factors leading to symptoms of posttraumatic stress and lack of well-being. In this study of child Holocaust survivors who are now in their sixties and seventies, we emphasize potential protective factors facilitating participants' adaptation to post-Holocaust life. We used Antonovsky's (1979, 1987) salutogenic paradigm that addresses the crucial question of how some people succumb under the pressure of their traumatic experiences, whereas others appear to cope surprisingly well. In search of the origins of physical and psychological health ("salutogenesis"; Antonovsky, 1991), the salutogenic paradigm tries to elucidate the salutary factors that promote health and well-being even when people are faced with inevitable traumatic events. The central concept of the salutogenic paradigm is *sense of coherence* (SOC), a generalized orientation toward the world which perceives it as less or more comprehensible, manageable, and meaningful. In this study, we test the mediating and moderating effect of participants' SOC on the association between early childhood deprivation due to Holocaust persecution and posttraumatic stress later in life.

This study specifically evaluated the long-term effects of persecution on the youngest child survivors of the Nazi Holocaust, now living in Israel. Born several years before or during the Second World War, they survived the persecution with losses, separations, mental and physical constraints, neglect and starvation during their first, most formative years (Dasberg, 1992; Kestenberg & Brenner, 1996). From earliest age on, they were confronted with their parents' efforts to prevent annihilation, and were witness to their helplessness in providing basic protection and safety. Many of these children survived by being separated from their parents, and by being put in the care of strangers. Some found safety and stability while staying with one care provider; others were moved around from one place to another (Flim, 2004; Fogelman, 1994; Meijer, 2001).

After the war the participants of this study faced further separations: For some, surviving parents who had suddenly disappeared during the war now returned to reclaim the children from caretakers who had led them through the most dangerous moments (Evers-Emden & Flim, 1995). Many of these parents, physically and mentally exhausted, and forced to start building a new life, were not able to take proper care of their surviving children, and opted for putting them (again) into the care of others (Evers-Emden, 1994). Children who had become orphans were dependent on the mercy of strangers and had often to suffer custody arrangements not always chosen for their best interests (Dasberg, 2001; Keilson, 1992; Verhey, 1991). All were confronted with the havoc the Holocaust had wreaked on family, social, and cultural structures (Kestenberg & Gampel, 1983). Some of them had to adjust to even more separations and changing circumstances when being moved from country to country, before immigrating to Israel (Lev-Wiesel & Amir, 2000).

Now in their sixties to early seventies, these child Holocaust survivors had to deal with the stresses of war and terrorism over the years (Brodsky & DellaPergola, 2005). Nevertheless, many showed remarkable ability to live apparently normal lives (Tauber, 1996; Van der Hart, Nijenhuis, Steele, & Brown, 2004); others, unable to

escape the past, were less successful in coping with the demands of daily life (Kellermann, 2001; Kestenberg & Brenner, 1996; Kestenberg & Gampel, 1983; Krell, 1985; Tauber & Van der Hal, 1997). Krell (1985) was the first to suggest a differentiation between late effects of the Holocaust on those who, as children or adolescents (born 1927–1945), had to endure persecution and fear of annihilation during crucial developmental stages, and other survivors. Later-life influences of the Holocaust on child survivors of all ages have been extensively studied in Israel and abroad (see Dasberg, 2001, for a review). The psychological functioning of child survivors, in comparison with that of matched peers who had not experienced the Holocaust, has recently been the focus of a number of studies (Amir & Lev-Wiesel, 2003; Brom, Durst, & Aghassy, 2002; Cohen, Brom, & Dasberg, 2001; Cohen, Dekel, & Solomon, 2002; Sagi, Van IJzendoorn, Joels, & Scharf, 2002; Sagi-Schwartz, Van IJzendoorn, Grossmann, Joels, Grossmann, et al., 2003). Results consistently show that child Holocaust survivors suffer significantly more from posttraumatic stress disorders than their non-Holocaust-exposed peers. Even higher levels of posttraumatic distress have been found in studies of child survivors who applied for treatment (Brom et al., 2002; Cohen et al., 2002). In our own study of 203 child survivors, we found 36% of the respondents to be suffering from current posttraumatic functional impairments, whereas 63% did not report symptoms of posttraumatic stress (Van der Hal-van Raalte, Bakermans-Kranenburg, & Van IJzendoorn, in press; Van der Hal-van Raalte, Van IJzendoorn, & Bakermans-Kranenburg, 2007). During the last decade, practitioners and researchers have observed Holocaust survivors become increasingly vulnerable to posttraumatic stress in old age (Aarts & Op den Velde, 1996; Cohen et al., 2001; Dasberg, 1992; Ruskin & Talbot, 1996). Therefore, we were interested in assessing differences in stress vulnerability in old age for the participants of our study. We examined why some Holocaust survivors show more vulnerability to posttraumatic stress than others, who show less or none (Krell, 1993; Schnurr, Lunney, & Sengupta, 2004).

Referring to Antonovsky's (1979, 1987) concept of salutogenesis, Lomranz (2000) pointedly observed that in Holocaust-related posttraumatic stress research, "...we know much about posttraumatic illness, but little about posttraumatic health and adjustment ..." (p. 49). Antonovsky was drawn to the concept of salutogenesis, defining health as a continuum from ease to disease, based on the results of an epidemiological study on menopausal complaints among women of five different Israeli subcultures (Antonovsky, Maoz, Dowty & Wijzenbeek, 1971). In one of the groups, consisting of immigrants from Central Europe, 77 of the 287 participants were Holocaust concentration camp survivors; the other 210 had left Europe before the Holocaust. Although data showed that as a group the camp survivors suffered significantly more menopausal distress than pre-war immigrants, at the same time 40% of these concentration camp survivors were found to be in good physical health, and 29% showed adaptive emotional functioning. Antonovsky tried to answer the question of why some women, who had been subjected to the most destructive experiences conceivable, were able to lead well-adapted lives (Antonovsky, 1991). He proposed that three factors were important: (a) the ability to comprehend what happens around oneself, (b) the ability to manage a given situation alone or with the help of others, and (c) the ability to find some meaning for what is happening. Antonovsky hypothesized that these factors may emerge from genetic, constitutional, psychosocial, and socioeconomic resources (Antonovsky, 1987; Lindstrom & Eriksson, 2005a). The three factors together constitute what he defined as a sense of coherence (SOC), an orientation to life which enables one to

draw upon internal and external resources to manage stress in a health-promoting way, and to make effective use of coping mechanisms (Eriksson & Lindstrom, 2006).

The results of a review of 458 salutogenic publications and 13 doctoral theses between the years 1992–2003 (Eriksson & Lindstrom, 2005), support the conclusion that SOC is apparently a health resource that promotes resilience and a positive subjective state of health, particularly mental health. Different from other efficacy and adaptation concepts such as “hardening,” “coping,” or “resilience” (Bonanno, 2004), and “positive change following trauma” (Linley & Joseph, 2004), SOC is seen as an orientation to life that develops over the years and is consistently geared to adaptation and problem-solving (Lindstrom & Eriksson, 2005b). The Orientation to Life Questionnaire, constructed to assess SOC (Antonovsky, 1993), has been used in numerous studies over the last two decades, and has shown main, moderating, and mediating effects of SOC on both physical and mental health (Eriksson & Lindstrom, 2005; Høgh & Mikkelsen, 2005). For example, Jorgensen, Frankowski, and Carey (1999) demonstrated the moderating effect of the SOC in a study of 116 undergraduates. They assessed self-reported health status, and psychological distress on two later occasions with a 2-month interval. Assessment of SOC took place at Time 1. At Time 2, negative life events were assessed that had occurred during the past year. More SOC was associated with less negative life events and with less reported psychological symptoms at both times of assessment. More negative life events were associated with more physical disorders reported on both occasions, but only among students with a weak SOC. This association remained significant after accounting for the relation between psychological and physical symptoms.

To the best of our knowledge, no other study has so far investigated a moderating or mediating role of the SOC on later psychological well-being after childhood adversity as severe as the Holocaust. The results of a Canadian study based on data from the national population health survey of 1994/1995 ( $N = 14,500$ , aged 12 and older) showed that childhood trauma was strongly associated with the SOC in the expected direction, but did not expand to find moderating or mediating properties (Stephens, Dulberg, & Joubert, 1999). However, in a convenience sample of 193 French adults (average age of 54 years), the SOC was found to have a mediating role between adversity and stress (measured by anxiety, worry, and stressful experiences scales), and psychological well-being. It was also found to have a moderating role, in that adversity and stress had a significant effect on the well-being of respondents with a weaker SOC, whereas they did not affect those with a stronger SOC (Kamel, 2001).

In the current study, we assessed how early childhood deprivation due to severe traumatic experiences during the Holocaust was related to posttraumatic stress at a later age, and we examined how SOC affected this association. Based on the work of Keilson (1992) and on the results of our previous studies (Van der Hal-van Raalte et al., in press; Van der Hal-van Raalte et al., 2007), indicators chosen for severity of Holocaust survival exposure included (a) time of exposure to persecution; (b) number of transitions during the Holocaust, each of which potentially increased life threat, and the anxiety for, and repetition of, the original separation trauma; and (c) loss of parents as a result of the Holocaust. We tested whether the association between Holocaust experiences and posttraumatic stress was mediated by SOC (with more severe Holocaust experiences leading to a lower SOC, and lower SOC associated with more posttraumatic stress symptoms), or whether SOC moderated the impact of Holocaust experiences on posttraumatic stress symptoms. We

hypothesized that in the moderating model high SOC would act as a protective factor (Rutter, 1987), buffering the impact of traumatic Holocaust experiences on child survivors in old age.

## Method

### *Participants*

Participants were 203 Holocaust child survivors, born between 1935 and 1944 in West-, Central-, and East-European countries, which were occupied by the Nazi regime. The survivors had immigrated to Israel after 1945, the end of the Holocaust persecution. A nonconvenience sample was created by reviewing demographic information provided by the Israel Ministry of Interior Affairs. Child Holocaust survivors were identified by year of birth, country of birth, and date of immigration into Israel. The sample is a nonconvenience sample in that we did use a Holocaust-independent registry to recruit our sample, in contrast with Holocaust-related sources such as support groups for Holocaust survivors. Israeli laws concerning protection of privacy were followed. Invitations to participate in the study were sent by regular mail to 410 available addresses of survivors who met the above-mentioned criteria for inclusion. In follow-up telephone calls, we were able to reach 293 survivors. Forty-nine candidates refused to participate. Nonparticipants explained their refusal as a need to let the past rest, or as not having the strength to relate to the past. Another forty-one candidates were not available for participation during the period of the study. Participants indicated that their decision to volunteer in the research project was motivated by their approval of its aims. They signed a form of informed consent after receiving an explanation concerning the nature and purpose of the study. Participation consisted of completing self-report questionnaires. The procedure took  $1\frac{1}{2}$  hours on average. Research assistants supervised the procedure, which took place at their home or at the research office, depending on the participants' preference. Research team members signed guarantees of confidentiality.

The survivors were on average 65 years old (mean age = 64.64;  $SD = 2.76$ ), and 63% were women. Their socioeconomic status as derived from educational level was middle class, and homogeneous. They were generally well educated, at college level or higher. One third of the participants ( $n = 67$ ) indicated that they had received psychotherapy. For the purpose of analysis, the sample was divided into three age groups: born 1935–1937 ( $n = 60$ ), 1938–1940 ( $n = 70$ ), and 1941–1944 ( $n = 73$ ). This division reflects the progressively diminishing safety in which they were born, first before, and later during Nazi persecution. Twenty-seven child survivors (13%) had lost both their parents during the Holocaust, 46 had lost one parent (23%), and for the remaining (64%) both parents survived.

### *Instruments*

*Holocaust Survival Exposure Questionnaire.* The questionnaire that we created for this study consists of demographic and specific Holocaust survival-related questions. In the current study, we focused on questions pertaining to the severity of Holocaust exposure as defined by the number of times that participants were exposed to the stress of escaping persecution, the number of geographical and relational transitions they experienced (e.g., to evade arrest and deportation), and the loss of parents, which resulted in dependency on alternate caregivers after the

war. Because the distribution of number of transitions was skewed, we used the logarithmic transformation of the variable in the analyses (Tabachnik & Fidell, 2001).

*Physical health status.* Physical health status was assessed with a self-report questionnaire developed by the Herczeg Institute on Aging (Tel-Aviv University), listing 18 chronic physical illnesses. Respondents were asked to indicate which, if any, illness they had suffered during the last month. This questionnaire is widely used in Israel for sociodemographic research on the aged.

*Posttraumatic stress.* We used the Post-Traumatic Stress Diagnostic Scale, devised by Foa (PDS; Foa, Riggs, Dancu, & Rothbaum, 1993). Posttraumatic stress disorder (PTSD) was assessed by means of the total score on the PDS. This 49-item self-report scale assesses symptoms of PTSD according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV;* American Psychiatric Association [APA], 1994). It provides a categorical diagnosis of PTSD, as well as an overall measurement of symptom severity. The instrument showed good internal consistency and test-retest reliability (Foa et al., 1993). The test items correspond to *DSM-IV* (APA, 1994) diagnostic criteria for PTSD, indicating satisfactory convergent validity and concurrent validity assessed by self-report measures of depression and anxiety (Foa, Cashman, Jaycox, & Perry, 1997). The instrument in its Hebrew translation is widely used in Israel. In the current study, we assessed the PTSD Criteria B, C, and D: reexperiencing, consisting of five items; avoidance, consisting of seven items; and arousal, consisting of five items. Each item was answered on a Likert scale of 0 to 3 (0 = *least*; 3 = *most*). The total scale of 17 items demonstrated high consistency ( $\alpha = .92$ ,  $n = 184$ ), and the reliability coefficients for the subscales were adequate as well (reexperiencing,  $\alpha = .85$ ,  $n = 195$ ; avoidance,  $\alpha = .84$ ,  $n = 188$ ; arousal,  $\alpha = .85$ ,  $n = 198$ ).

*Orientation to Life Questionnaire.* The Orientation to Life Questionnaire (OLQ; Antonovsky, 1993) was developed to assess SOC, and has been used widely over the past two decades. The Hebrew version has been used in Israel since its origination. The short version used in this study consists of 13 items (the original version contains 29 items). The items are rated on a 7-point rating scale, with higher scores indicating more SOC. The Cronbach's alpha values in 127 studies using this short version range from 0.70 to 0.92 (Erikson & Lindström, 2005). Test-retest correlation shows stability, and ranges from 0.69 to 0.78 (1 year), 0.64 (3 years), 0.42 to 0.45 (4 years), 0.59 to 0.67 (5 years) to 0.54 (10 years). The means range from 35.39 ( $SD = 0.10$ ) to 77.60 ( $SD = 13.80$ ). The OLQ demonstrated adequate consistency in our sample ( $\alpha = .79$ ,  $n = 203$ ).

## Results

### *Preliminary Analyses*

Male participants were somewhat older than female participants, but they reported significantly fewer physical illnesses (see Table 1). There were no differences between men and women on any of the other variables including Holocaust experiences, SOC, and posttraumatic stress indices.

Table 1  
Demographic Variables of the Study Sample

	Women			Men			Total			<i>t</i>	Effect size <i>d</i>
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>		
Age	127	64.3	(2.77)	76	65.1	(2.72)	203	64.6	(2.77)	-2.08*	0.30
Physical illnesses	127	2.47	(2.21)	76	1.75	(1.65)	203	2.2	(2.04)	2.47*	0.36
Loss of parents during war	127	0.47	(0.69)	76	0.54	(0.77)	203	0.50	(0.72)	-0.64	0.09
Number of transitions during war <sup>a</sup>	126	2.8	(2.11)	76	2.8	(2.03)	202	2.8	(2.07)	0.24	0.03
Period of persecution	124	2.8	(1.53)	75	2.9	(1.52)	199	2.8	(1.52)	-0.35	0.05
PDS Total	126	8.09	(10.08)	76	6.66	(9.06)	202	7.55	(9.71)	1.01	0.15
Reexperience	121	2.86	(3.74)	74	2.32	(3.68)	195	2.66	(3.71)	0.98	0.14
Avoidance	118	2.46	(3.86)	70	2.49	(4.37)	188	2.47	(4.05)	-0.05	0.01
Arousal	124	2.61	(3.89)	74	1.70	(2.72)	198	2.27	(3.52)	1.77	0.26
Sense of coherence	127	61.38	(11.83)	76	64.07	(9.52)	203	62.39	(11.08)	-1.68	0.24

Note. PDS = Post-Traumatic Stress Diagnostic Scale.

<sup>a</sup>Untransformed.

\* $p < .05$ .

### Bivariate Associations

Age was associated with number of transitions. As shown in Table 2, older participants reported experiencing a larger number of transitions during the Holocaust, and more often lost one or both of their parents. Not unexpectedly, age was also related to the length of the persecution period: Older participants reported to have experienced a significantly longer period of persecution. On most posttraumatic stress indices we found no association with age, except for a small but significant relation with the PDS scale for reexperiencing. Older participants reported more often reexperiencing their past traumas; SOC was not related to age. Participants with more physical illnesses also reported more posttraumatic stress and had lower SOC scores. Participants who reported more parental losses and more transitions reported more traumatic stress symptoms. Lastly, participants with a higher SOC reported fewer posttraumatic stress symptoms in all domains of the PDS (see Table 2).

### Multivariate Analyses

We conducted a hierarchical multiple regression analysis predicting current posttraumatic stress (PDS total) based on the following independent variables: physical illnesses (first step), loss of parents during the war, number of transitions, and period of persecution (second step). The beta weights for the separate predictors in both steps are based on the final regression equation including all predictors (see Table 3). The number of physical illnesses significantly contributed to the prediction of posttraumatic stress. However, the number of transitions and the loss of parents also significantly predicted posttraumatic stress symptoms, after controlling for physical illnesses. We entered physical illnesses in the first step because they might

Table 2  
*Associations Among Background Variables, Holocaust Experiences, Posttraumatic Stress Indices, and Sense of Coherence*

	Age	Physical illness	Loss of parents during war	Number of transitions during war	Period of persecution	PDS			
						Total	Reexperience	Avoidance	Arousal
Age	--								
Physical illnesses	.12	--							
Loss of parents during war	.15*	.05	--						
Number of transitions during war	.21**	.12	.12	--					
Period of persecution	.34**	.06	.18**	.32**	--				
PDS						--			
Total	.09	.31**	.20**	.23**	.16*				
Reexperience	.15*	.23**	.18*	.18*	.18*	.87**	--		
Avoidance	-.00	.20**	.15*	.17*	.14	.90**	.64**	--	
Arousal	.06	.35**	.17*	.23**	.13	.87**	.66**	.71**	--
Sense of coherence	-.03	-.24**	-.01	-.13	-.05	-.43**	-.29**	-.41**	-.43**

Note. PDS = Post-Traumatic Stress Diagnostic Scale.

\* $p < .05$ ; \*\* $p < .01$ .

affect posttraumatic stress responses independent of earlier Holocaust experiences. More physical illnesses, more transitions, and higher parental losses predicted more posttraumatic stress (see Table 3). Similar results were found for the PDS domain of arousal. For the PDS domains of reexperience and avoidance only physical illnesses appeared to be a significant predictor (see Table 3).

To examine the role of SOC in predicting posttraumatic stress, we repeated the hierarchical multiple regression predicting current posttraumatic stress (PDS total) from physical illnesses (first step); SOC (second step); and loss of parents during the war, number of transitions, and period of persecution (third step). The steps were ordered from recent to earlier influences on current posttraumatic stress. Sense of coherence contributed significantly to the regression. Greater SOC predicted fewer posttraumatic stress symptoms (see Table 4). Similar results were found for the three PDS domains of reexperiencing, avoidance, and arousal. Greater SOC independently predicted less posttraumatic stress in each of the three domains (see Table 4).

#### *Does SOC Mediate the Association Between Holocaust Experiences and the PDS?*

We tested whether the association between Holocaust surviving experiences, in particular number of transitions during the persecution, which showed the highest association with the PDS (see Table 3), and posttraumatic stress was mediated by SOC. Empirical support for mediation requires that (Baron & Kenny, 1986) (a) the number of transitions is significantly associated with SOC, (b) the number of transitions is significantly associated with posttraumatic stress, (c) the SOC is significantly associated with posttraumatic stress, and (d) once SOC is added to the equation, the relation between number of transitions and posttraumatic stress is no

Table 3

Regression Analysis Predicting PDS Total and the PDS Subscales From Physical Illnesses and War Experiences

	<i>R</i>	<i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> <i>Ch</i>	<i>F</i>	<i>df</i>	$\beta^a$	<i>p</i>
<b>PDS Total</b>							
Step 1	.31	.09	.09	20.15	(1,196)		<.01
Physical illnesses						.28	<.01
Step 2	.40	.16	.07	9.19	(4,193)		<.01
Loss of parents during war						.15	.03
Number of transitions						.16	.03
Period of persecution						.07	.33
<b>PDS Reexperience</b>							
Step 1	.23	.05	.05	10.54	(1,189)		<.01
Physical illnesses						.20	<.01
Step 2	.33	.11	.06	5.78	(4,186)		<.01
Loss of parents during war						.14	.06
Number of transitions						.11	.13
Period of persecution						.11	.15
<b>PDS Avoidance</b>							
Step 1	.20	.04	.04	7.85	(1,182)		<.01
Physical illnesses						.18	.01
Step 2	.29	.08	.04	4.05	(4,179)		<.01
Loss of parents during war						.11	.13
Number of transitions						.12	.12
Period of persecution						.07	.37
<b>PDS Arousal</b>							
Step 1	.35	.12	.12	26.36	(1,192)		<.01
Physical illnesses						.32	<.01
Step 2	.42	.18	.05	10.02	(4,189)		<.01
Loss of parents during war						.13	.05
Number of transitions						.17	.02
Period of persecution						.03	.70

Note. PDS = Post-Traumatic Stress Diagnostic Scale.

<sup>a</sup>The betas are derived from the final block of the regression model.

longer statistically significant. Examining these associations, we found that transitions were significantly related to posttraumatic stress ( $r = .23, p < .01$ ), and SOC was also significantly related to posttraumatic stress ( $r = -.43, p < .01$ ), but number of transitions was not significantly associated with SOC ( $r = -.13, p = .06$ ). One of the requirements for mediation (step 1) was thus not met. By implication, the association between number of transitions during the persecution and posttraumatic stress was not mediated by SOC (see Figure 1).

#### *Does SOC Moderate the Association Between Holocaust Experiences and the PDS?*

Because high scores on SOC might be necessary to affect the association between Holocaust experiences and the PDS, participants were divided into two groups, scoring higher (>75th percentile) or lower (<75th percentile) on SOC. From a salutogenic perspective, it seemed important to stress the (small) group of most coherent participants and contrast this group with the larger group of those being more or less coherent. The group of participants with high scores on SOC did not differ from the other participants on age,  $t(201) = 0.90, p = .37$ ; gender,  $\chi^2(1, N = 203) = 0.19, p = .67$ ; physical illnesses,  $t(201) = 1.29, p = .20$ ; loss of parents

Table 4  
Regression Analysis Predicting PDS Total From Physical Illnesses, Sense of Coherence, and War Experiences

	<i>R</i>	<i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> <i>Ch</i>	<i>F</i>	<i>df</i>	$\beta^a$	<i>p</i>
PDS Total							
Step 1	.31	.09	.09	20.15	(1,196)		<.01
Physical illnesses						.19	<.01
Step 2	.48	.23	.14	28.83	(2,195)		<.01
Sense of coherence						-.36	<.01
Step 3	.53	.28	.06	15.20	(5,192)		<.01
Loss of parents during war						.16	.01
Number of transitions						.12	.08
Period of persecution						.07	.31
PDS Reexperience							
Step 1	.23	.05	.05	10.54	(1,189)		<.01
Physical illnesses						.15	.03
Step 2	.33	.11	.06	11.70	(2,188)		<.01
Sense of coherence						-.24	<.01
Step 3	.40	.16	.05	7.17	(5,185)		<.01
Loss of parents during war						.14	.04
Number of transitions						.09	.23
Period of persecution						.10	.15
PDS Avoidance							
Step 1	.20	.04	.04	7.85	(1,182)		<.01
Physical illnesses						.10	.17
Step 2	.43	.18	.14	19.97	(2,181)		<.01
Sense of coherence						-.37	<.01
Step 3	.46	.21	.03	9.69	(5,178)		<.01
Loss of parents during war						.12	.08
Number of transitions						.08	.27
Period of persecution						.07	.35
PDS Arousal							
Step 1	.35	.12	.12	26.36	(1,192)		<.01
Physical illnesses						.24	<.01
Step 2	.50	.25	.13	31.89	(2,191)		<.01
Sense of coherence						-.36	<.01
Step 3	.54	.29	.04	15.61	(5,188)		<.01
Loss of parents during war						.14	.03
Number of transitions						.13	.05
Period of persecution						.03	.70

Note. PDS = Post-Traumatic Stress Diagnostic Scale.

<sup>a</sup>The betas are derived from the final block of the regression model.

during the Holocaust,  $t(201) = -0.03, p = .98$ ; and number of transitions and period of persecution,  $t(95.39, \text{unequal variances}) = 0.65, p = .52$ . They had lower scores on the PDS ( $M = 3.84, SD = 6.32$ ) than did the other group ( $M = 8.77, SD = 10.32$ ),  $t(138.23, \text{unequal variances}) = 4.03, p < .01$ . We conducted a multivariate hierarchical regression on the PDS, with SOC and the number of transitions as predictors in the first step, and the interaction between these variables (centered before their product was computed) in the second step. The overall regression was significant,  $F(3, 197) = 8.64, p < .01$ . All three predictors contributed significantly to the regression equation, SOC ( $\beta = -.22, p < .01$ ), number of transitions ( $\beta = .19, p < .01$ ), and the interaction between SOC and number of transitions ( $\beta = -.15, p = .03$ ). Post hoc analyses for the highly coherent subgroup and the less coherent subgroup were

conducted to clarify the interpretation of the significant interaction effect (Aiken & West, 1991; Dearing & Hamilton, 2006). For the highly coherent subgroup, we found a nonsignificant correlation of  $r(49) = -.11$  ( $p = .43$ ) between number of transitions and PDS total, whereas for the less coherent subgroup the correlation was significant,  $r(152) = .28$  ( $p < .01$ ). These correlations differed significantly ( $Z_{diff} = 2.36$ ,  $p = .02$ ). Sense of coherence reduced the impact of number of transitions during the war on the PDS, confirming the moderating model (see Figure 2).

### Discussion

The results of our study show that, even six decades after the end of the war, for child survivors who endured the most severe Holocaust survival exposure their sense of coherence moderates the association between traumatic experiences during the war and posttraumatic stress. It appears that a strong sense of coherence acts as a protective factor (Rutter, 1987), buffering the impact of traumatic Holocaust experiences on child survivors in old age. In contrast, survivors without such sense of coherence are left more vulnerable to present-day posttraumatic complaints.

Antonovsky (1987) considered a (weak or strong) sense of coherence to be an overall behavioral response to stress, acquired over the years. Several findings support this view (Breslin, Hepburn, Ibrahim, & Cole, 2006; Flannery & Flannery,

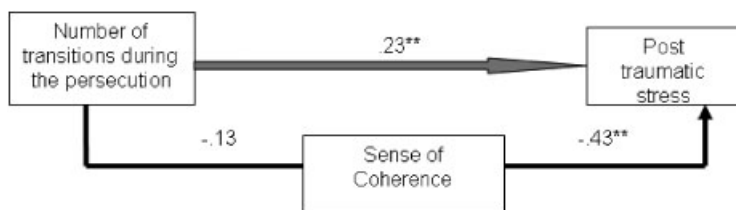


Figure 1. Sense of Coherence Does Not Mediate the Association between Number of Transitions during the War and Post-Traumatic Stress.

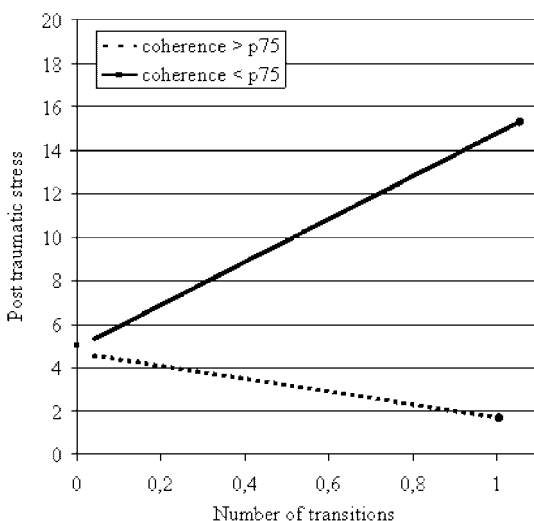


Figure 2. Sense of Coherence Moderates the Association between Number of Transitions during the War (log transformed) and Post-Traumatic Stress.

1990; Schnyder, Büchi, Sensky, & Klaghofer, 2000; Szymona, 2005). The sense of coherence seems to maintain active, developmental qualities; it is only after years that stable, trait-like characteristics are acquired. Considering sense of coherence as a trait (Schnyder et al., 2000), we may interpret its moderating role as a protective mechanism against the negative consequences of the Holocaust experiences in older age. Survivors with a strong sense of coherence may be less preoccupied by the traumatic consequences of their Holocaust experiences. Through their strong sense of coherence, they may have made sense of the Holocaust survival and—in retrospection—of their own active role in coping with the Holocaust.

A somewhat different, but not incompatible view, seems to be implied in the findings of Sagy and Antonovsky (2000). In their study of semistructured life-history interviews among Israeli retirees, they found that “participation in shaping outcomes” was the most relevant childhood experience related to an adult level of sense of coherence. If sense of coherence were shaped during the life-threatening circumstances of the Holocaust, it would be as much a consequence of the Holocaust as it would be a cause for a specific type of coping with the Holocaust experiences. For survivors who actively participated in their own rescue, this might have led to a stronger salutogenic orientation. Even small children have been observed by their caregivers in hiding places and in concentration camps to participate in shaping positive outcomes at critically dangerous moments. For example, adult witnesses reported how persecuted infants and toddlers “knew” not to move or to make any noise when their hiding place was searched by the Nazis, even when they were hidden under the floor, under layers of blankets, or in dark cupboards (Evers-Emden, 1994; Kestenberg & Brenner, 1996). However, child survivors who had to passively endure exposure to everchanging dangers, may have developed a weak sense of coherence and as a consequence might have become more vulnerable to posttraumatic stress symptoms (Bar-On et al., 1998; Van der Hal & Brom, 2007). A lack of options to participate in shaping outcomes was identified by Keilson (1992) as a cumulative traumatizing experience, as when, for example, during the post-Holocaust era war orphans became the victims of disputed guardianships and of decisions on their upbringing that were not always in their best interest. Based on the current, retrospective, and correlational design it is impossible to determine what developmental origins sense of coherence may have and how it is rooted in the early Holocaust surviving experiences.

Besides the equivocal causal role of sense of coherence in the current, basically correlational study, another limitation of this study is the possible underreporting of Holocaust traumatic experiences by survivors who were too young to remember what had happened to them. Many of them had to rely on information given to them by third parties after the fact, and autobiographical memory might have inadvertently reconstructed data and events of more than 60 years ago, and thus impacted the reliability of self-reported experiences with transitions and other traumatic events. This study is also limited in that the traumatic experiences our respondents could have been exposed to in the years after the Holocaust were not assessed. Such exposure may have influenced posttraumatic stress and sense of coherence in either positive or negative ways (see Brewin, Andrews, & Valentine, 2000).

The current study suggests a potential protective role of sense of coherence for child Holocaust survivors. Higher levels of sense of coherence seem to buffer the negative impact of the Holocaust experiences on feelings of well-being and of posttraumatic stress. During the last decade, aging child Holocaust survivors are

seeking psychotherapeutic help in increasing numbers (Dasberg, 2001; Durst, 2003). The moderating role of sense of coherence may generate fruitful hypotheses about promising avenues for therapeutic interventions. This study confirms today's prevailing insights on the necessity of establishing stabilization, and of assessing intrapersonal and interrelational resources before the implementation of more explorative psychotherapy with survivors of extreme trauma (Herman, 1992; Rothschild, 2000, Van der Kolk, Van der Hart, & Burbridge, 1995). Strengthening the sense of coherence may be given precedence over directly dealing with the Holocaust experience and other severe childhood traumas per se. More sense of coherence may contribute to better coping with those experiences.

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