

Children Exposed to Warfare: A Longitudinal Study

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Following the 1991 Gulf War a group of 94 children in Iraq were interviewed at 6 months, 1 year, and 2 years after the war. The group was exposed to the bombing of a shelter where more than 750 were killed. Selected items from different inventories, including the Impact of Event Scale (IES) assessed children's reactions. Results reveal that children continue to experience sadness and remain afraid of losing their family. Although there was no significant decline in intrusive and avoidance reactions as measured by the IES from 6 months to 1 year following the war, reactions were reduced 2 years after the war. However, the scores were still high, indicating that symptoms persist, with somewhat diminished intensity over time.

KEY WORDS: children; war; Iraq; Impact of Event Scale.

Wars vary in the stressors involved and the consequences they engender. The short, deadly Gulf War in January and February of 1991 stands in dramatic contrast to the conflict between forces during World War II, or the close personal fighting in Yugoslavia or Rwanda. The Gulf War affected some countries directly, many others indirectly. Reports have been published about the effects on the civilian population and about various mental health services provided in different countries, especially in Israel (Ben-David & Lavee, 1992; Ben-Zur & Zeidner, 1991; Klingman, 1992a, 1992b, 1992c; Zeidner, 1993) and Kuwait (Llabre & Hadi, 1994; Nader, Pynoos, Fairbanks, Al-Ajeel, & Al-Asfour, 1993). There are, however, few reports from Iraq where extensive bombing took place.

As the duration of the Gulf War was short compared to most wars, there supposedly were few major structural changes in the nurturing family and community ecology (Levy-Shiff, Hoffman, & Rosenthal, 1993). This would involve less of a threat to children from a developmental perspective. However, as trauma may also influence the adult system, this system's capacity for caring

or nurturing their children may have been reduced. There are few, if any, longitudinal studies of children during or following war. Although not thoroughly researched, reports suggest that greater levels of exposure to trauma in children are correlated with more PTSD symptoms (Bradburn, 1991; Nader et al., 1993; Pynoos, Frederick et al., 1987).

This study, apart from being one of the few studies of the psychosocial effects of the Gulf War on the children of Iraq, represents an effort to study the effects of war exposure on children over time. However, the underlying psychological processes that causes the course of reactions within and over time is a very complex topic that is not focused in this article.

The bombing of the Al Ameriyah shelter took place on February 13th, 1991. This modern shelter was used as a community center during the war. The number of people reported killed range from a low of 500 to more than 2000. A conservative estimate is that 1000 people were killed. Soon after the bombing, large crowds of both children and adults gathered outside the shelter and became witnesses to gruesome scenes and frantic rescue activity and were exposed to strong sensory impressions in the form of smells, sights, and screams. During the following days, people watched the extraction of burnt bodies from the shelter.

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Method

Participants

Six months following the Gulf War, the psychological impact on children and their families was assessed as part of an international study team that comprehensively surveyed the impact of the Gulf crisis on the health and welfare of the Iraqi population (Dyregrov & Raundalen, 1991). In August/September 1991, a total of 214 Iraqi children and adolescents aged 6–18, with approximately half the group from an area surrounding the shelter of Al Ameriyah in Baghdad and the other half from the southern city of Basra, was interviewed. On the invitation from UNICEF, children were reinterviewed in 1992 and 1993. In January/February of 1992, 101 children from the shelter area in Baghdad and 81 children from Basra were interviewed. In April 1993, 104 children of the Al Ameriyah group in Baghdad were reinterviewed. Basra was inaccessible during that visit. A total of 94 of the original 107 children living in the area close to the Al Ameriyah shelter have been interviewed three times (a response rate of 88%).

The mean age of the children was 11.5 years in 1991 (range 6–17). The children were grouped in three age groups, 6–9 years (26%), 10–13 years (47%), and 14–17 years (27%). The gender-distribution was 47% girls and 53% boys. There were no significant differences between the number of girls and boys in the three age groups. Almost all children lived with their families.

Measures

In 1991 a semistructured interview was used to gather demographic information, information about losses, separations and exposure to war events. The questions on exposure were based on the War Trauma Questionnaire (Macksoud & Aber, 1996). In addition, items from the Child Behavior Inventory (CBI) and a Posttraumatic Stress Reactions Checklist (PTSRC) was used. These measures were developed in collaboration between the Center for Crisis Psychology, in Bergen, Norway, and Columbia University in New York, USA. Finally, the Impact of Event Scale (IES—Horowitz, Wilner, & Alvarez, 1979) was included. This scale summarizes the impact of trauma on two dimensions, intrusion, and avoidance. Intrusion is characterized by distressing thoughts, feelings, and nightmares (7 items), whereas avoidant thinking and behavior, as well as psychic numbing (8 items) characterize avoidance. The IES scale is widely used internationally (Paton, 1990), and has been used with populations affected by war

(Kuterovac, Dyregrov, & Stuvland, 1994; Scwarzwald, Solomon, Weisenberg, & Mikulincer, 1987).

In 1992 and 1993, the Impact of Event Scale was readministered, and in addition some selected items from the CBI and PTSRC (see Table 2) were used. For the three years 1991, 1992, and 1993 the internal consistency of the Impact of Event Scale, measured by Cronbach's alpha was .77, .72, and .76 for intrusion, and .61, .64, and .61 for avoidance respectively. The reliability of avoidance was low, with an error variance from 36 to 39%. This is reflected in low average inter-item correlation (.14, .18, .17) and a big range in the same correlation (.99, .60, .44). Because of low reliability and a large range, item-analyses (correlation, alpha if item deleted, item-total correlation, and squared multiple correlation) were used to obtain a new and more homogeneous avoidance-scale. This scale consisted of the following items: "I tried to remove it from memory," "I have stayed away from reminders of it," "I have tried not to talk about it," and "I have tried not to think about it." The Cronbach's alpha was .60 (1991), .73 (1992), and .57 (1993), with average inter-item correlation .28, .41, and .25. To compare the new scale consisting of four items with the original scale with eight items, four new hypothetical items with the same inter-item correlation were added. The analyses showed that an 8-item scale with the same kind of items as in the 4-item scale resulted in Cronbach's alpha = .75, .85, and .72. The new scale still had relatively low reliability-coefficients, but was a more homogeneous measure. It was therefore decided to use the 4-item avoidance scale for further analyses. The two subscales were normally distributed, a necessary condition for doing parametric statistics. An 8-item shortened form of the IES has since this study was conducted been developed as a consequence of problems encountered when using the adult scale with children (Dyregrov & Yule, 1995; Yule, 1998). The four items comprising the new avoidance subscale are identical to the four items resulting from the analysis that was conducted to form a more homogenous scale in this study. The recommended clinical cutoff point for this scale is a score of 17 or above (Yule, 1998).

To achieve a better understanding of sensory exposure outside the shelter, some specific questions about this were included in 1993, along with grief items from a study by Pynoos, Nader, Frederick, Gonda, and Stuber (1987). The internal consistency of the 8-item grief scale was .69. Item-analyses showed that the scale became more reliable when the items "Have you changed some games you play because they remind you of her/him?" and the item "Have you felt that you wanted to be more like her/him?" were deleted (Cronbach's alpha = .74 for the 6-item scale).

The instruments were translated into Arabic by one of the interpreters and then retranslated into English by

another interpreter. All items were then discussed, with special emphasis on items where discrepancies were noted, where a uniform interpretation or an example of a difficult word or question was agreed upon (or both). Both translators had lived in English speaking countries for several years and earned part of their income as professional interpreters.

Procedure

The authors interviewed children living in the area surrounding the shelter, with the exception of the street where the shelter is situated. In 1991 two female interpreters from Jordan were used for translation, on the two later occasions the same female Iraqi interpreters translated. All interpreters had previous experience working with children.

Two teams (one psychologist and one interpreter) went from door to door in the area, and conducted a semistructured interview. No families refused to take part. When reinterviewing for the third time, one adolescent refused to be interviewed. People moving out of the area caused the attrition rate in the study.

After entering the house, the family was gathered, and the purpose of our visit was explained. It was stated that we wanted to learn what effects the war had on children. We requested that we be allowed to talk to the children alone, and then talk to the parents afterwards. On the following visits we said that we wanted to learn if there were any longterm consequences of the war on the children. No record was made of the families' names or addresses during the first visit to preserve anonymity, and much work went into tracing the families at the second visit. By visiting the same streets, recognizing the houses, and knowing the first names of the children we interviewed we were able to trace most of them. The rest were traced by soliciting the help of parents and children we had interviewed who knew the whereabouts of those who were interviewed.

After stating the purpose, children over 6 years of age and below 18 were interviewed individually. At the first visit, one or both parents were interviewed as well. At the last visit families were informed about a new center for Psychosocial Care for Children, partly sponsored by UNICEF, that had been set up based on our first two reports. This center offers help to war-traumatized children and their families.

Data Analysis

Statistica (ver. 5.1) was used to compute descriptive statistics, frequency analyses, and item analyses. Analyses

of variance, both group comparisons at one time point and over the three time points, were carried out in a repeated measure design. In order to analyze specific effects within the overall design, planned comparison were used.

LISREL 8.20 was used for structural equation modeling. Fit-measures used to evaluate the structural model were p -values for chi-square tests, GFI, AGFI, Standardized RMR, RMSEA (Root Mean Square Error of Approximation) with confidence intervals (CI), and testing of close fit based on this index. The first indexes are sample based, but the last one with the CI, estimate how well the model fits the population. In addition to this, RMSEA is a parsimonious index (fit/degree of freedom). This prevents the researcher from adding more parameters to get a better fit between data and model, in contrast to the GFI. In RMSEA, values less than .05 are considered as close fit, values in the range of .05–.08 as fair fit, values in the interval .08–.10 as mediocre fit, and values above .10 as poor fit. RMSEA at 0 indicates perfect/exact fit (Browne & Cudeck, 1993).

To analyze the relation between exposure and reaction (IES), a structural equation model with gender, age, and sensory exposure as exogenous (predictive) variables and intrusion and avoidance in 1991, 1992, and 1993 as the endogenous latent variables were used. This follows the MIMIC model described by Jöreskog and Sörbom (1996) within a longitudinal design.

Because of the small sample size, the sum of all variables on each IES dimension was used as manifest indicator instead of the variables separately. The sum of all the avoidance items (not the shortened IES version) was used. Residual variance in the manifest IES subscales were computed on the basis of Cronbach's alpha and fixed as residuals parameters in the model. This procedure is described by Kline (1998). The factor-loadings in the exogenous variables were set to 1.0 and the residuals to 0.0. The advantage of this procedure was an analysis that controlled for measurement error in the IES and a stronger statistical control as several variables are estimated simultaneously as in all regression models. In this type of model, statistically significant parameters are controlled for by the other variables in the analysis.

To establish a parsimonious model with as few parameters as possible, a first analysis was computed without any relations between exogenous and endogenous variables. Then nonsignificant relations within the exogenous variables were removed. The main purpose of this analysis was to predict the trauma reaction on the basis of exposure, gender, and age. We did not focus on the relations within the reaction variables, as this problem would deserve a much more complex and theoretical discussion. Modification indices in each estimation were used to free up the

index giving the largest increase in fit between data and model. The model was reestimated using a forward stepwise procedure until a reasonable fit was achieved and all possible statistical relations estimated. As an example, all possible relations between intrusion and avoidance 1991–1993 were not included in the model, but only the paths that were found to be statistically significant.

Results

Exposure

Table 1 shows the children's exposure to various stressors. In 1993 the children were asked if they were present in the area when the bombs fell on the shelter, and 83% answered affirmatively. Sixty-nine percent went to the shelter following the bombing. Most children went with their siblings (45%), parents (29%), or friends (24%). Concerning sensory exposure, the smell of burnt bodies and hearing the screams from people outside the shelter were reported as the most frequent exposure. More than half the children had also seen dead bodies, and many saw body parts.

About 30% had been forced to separate from father or male primary caregiver. Nearly 40% (37%) had been exposed to extreme poverty/deprivation because of the war conditions (such as being without food, drink, or shelter).

One fifth (20%) had lost close family members. Almost all children claimed to have lost close friends (mean number of friends lost was 4). Of those who claimed to

have lost friends, 91% claimed to have lost their best friends during the bombing.

Reactions

Table 2 shows the mean score of some reported reactions assessed at all three time points (selected items from the CBI and PTSRC). A majority of children reported that they felt unhappy (*sometimes* or *always*) at all three time points. There was a decrease in unhappiness from 1991 to 1993. The change over time was significant (see Table 2). A planned comparison analysis showed both the decreases from time 1 to time 3, $F(1, 77) = 11.58, p < .01$, and from time 2 to time 3, $F(1, 77) = 9.16, p < .01$, to be significant.

Eighty percent or more continued to experience fear of losing their family sometimes or always over the three years, with a slight nonsignificant increase from 1991 to 1992, and then remaining high (81%).

For some items, we only had scores from two time points. A majority experienced irritability (*sometimes* or *always*) at time 1 and time 2, and more than a third experienced concentration problems at time 2 and time 3. Around half the group perceived a lack of understanding from friends and parents at time 2 (47%) and time 3 (56%). Table 2 shows the rise from 1992 to 1993 to be statistically significant. Loneliness followed a different course, with a significant decrease over time. A planned comparison analysis showed a significant decrease from time 1 to time 3, $F(1, 70) = 130.86, p < .001$, but not from time 2 to time 3, $F(1, 70) = 2.51, ns$. More than half the group reported that they never had talked with their parents about how they were feeling (57% in 1992, 60% in 1993). Although 32% wanted their parents to talk more about what happened at the one-year follow-up, only 24% expressed this desire after 2 years.

There was a significant rise in optimism for the future from 1992 to 1993 (see Table 2). But evidently many worried about not living to be adults. One year following the war the percentage was 43%, and 2 years after the war it was 50%. Three fourths of the children (76%) reported being jumpy at half a year and again at one year after the war.

IES Reactions

The descriptive statistics for IES intrusion and avoidance are shown in Table 3. In a one-way analysis of variance with IES intrusion in a repeated design (1991, 1992, and 1993) and gender as an independent variable,

Table 1. Exposure to War-Related Experiences

	<i>N</i>	%
Threat (presence in area or at the shelter)		
In area when bombs fell	78	83
Went to the shelter	65	69
Sensory exposure		
Saw dead bodies	53	58
Saw body parts	37	41
Heard screams from inside	29	32
Heard screams from outside	63	68
Smelled burnt bodies	71	76
Separation		
Father	19	29
Poverty/deprivation	25	37
Loss		
Loss of anyone close to him/her	71	93
Lost friends	84	91
Lost father/mother	4	4
Lost siblings	5	4
Parents and siblings	2	2
Other relatives	9	10

Note. $N \leq 94$.

Table 2. Means and Standard Deviations on Reactions in 1991–1993

Question ^a	Time of interview			F
	1991	1992	1993	
Do you feel sad or unhappy?	2.96 (1.07)	2.90 (1.26)	2.35 (1.21)	7.28***, <i>df</i> = 2, 154
Are you afraid of loosing your family (i.e. through death or separation)?	3.07 (1.19)	3.39 (1.07)	3.15 (1.20)	1.77, <i>df</i> = 2, 156
Do you get easily irritated?	2.57 (1.17)	2.38 (1.20)	—	1.17, <i>df</i> = 1, 75
Is it more difficult for you to concentrate on things than before (the war started)?	—	2.36 (1.29)	2.15 (1.29)	1.42, <i>df</i> = 1, 86
Since the war started, do you think that friends or parents don't really understand what you are going through?	—	2.04 (1.41)	2.43 (1.40)	4.27*, <i>df</i> = 1, 93
Have you talked with your parents about how you are feeling?	—	2.01 (1.20)	1.80 (1.14)	2.13, <i>df</i> = 1, 93
Are you optimistic about the future?	—	3.08 (1.23)	3.55 (1.02)	8.36**, <i>df</i> = 1, 92
Since the event happened, do you feel more alone inside as if your friends or parents do not really understand what you are going through?	0.59 (0.49)	0.56 (0.50)	0.42 (0.50)	3.35*, <i>df</i> = 2, 160
Would you have liked your parents to talk more about what has happened?	—	0.31 (0.47)	0.25 (0.44)	0.86, <i>df</i> = 1, 82
Since the event happened, do you worry that you may not live to become an adult?	0.64 (0.48)	0.43 (0.50)	0.51 (0.50)	4.46*, <i>df</i> = 2, 148
Since the event happened, do you jump at loud noise or at unexpected things?	0.75 (0.43)	0.76 (0.43)	—	0.05, <i>df</i> = 1, 88

Note. The values given in parentheses are standard deviations.

^aThe first seven questions had the following answer categories: 1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *always*. The last four questions had the answer categories: 0 = *no*, 1 = *Yes*.

* *p* < .05. ** *p* < .01. *** *p* < .001.

the only significant effect in an overall testing was time, $F(2, 184) = 13.26, p < .05$. Planned comparison analysis showed a significant decrease in intrusion-score from 1992 to 1993, $F(1, 92) = 26.70, p < .001$. No difference was found between 1991 and 1992 in the total score, $F(1, 92) = 0.15, p > .05$. A similar finding was found for the avoidance-scores, $F(2, 184) = 3.76, p < .05$. But here the results showed an increase in avoidance-score from 1991 to 1992, $F(1, 92) = 5.63, p < .05$, and a decrease from 1992 to 1993, $F(1, 92) = 7.47, p < .01$.

A similar design with age-groups again showed time to have a significant effect, $F(2, 182) = 13.94, p < .001$. Planned comparison showed that 6–9-year-old children scored significantly lower on intrusion in 1992 than the other children, $F(1, 91) = 4.46, p < .05$. Further analysis showed that the children aged 14–17 decreased significantly more on intrusion than the other two age groups from 1992 to 1993, $F(1, 91) = 4.51, p < .05$. For the avoidance-score, it was found that both time and

age-group had significant effects: time, $F(2, 182) = 5.25, p < .01$; age-group, $F(2, 91) = 3.60, p < .05$. The group of 10–13-year-old children had the highest score on avoidance.

Using a cutoff point at 17 or above (Dyregrov & Yule, 1995; Yule, 1998), 84, 88, and 78% scored in the risk group at the three respective time points (1991, 1992, 1993). Scores above the cutoff point are often associated with a clinical diagnosis of PTSD.

The structural equation model with gender, age, and sensory exposure as exogenous variables (measured in 1993) and intrusion and avoidance in 1991–1993 as endogenous variables were estimated as previously described. Number of observations in this model was 91. The end result after several reestimations is presented in Fig. 1. All parameters are statistically significant ($p < .05$) and completely standardized.

The results show a relation from exposure to dead bodies to intrusion in 1992, from exposure to bodyparts to

Table 3. Descriptive Statistics for Impact of Event Scale

	1991		1992		1993	
	Intrusion	Avoidance	Intrusion	Avoidance	Intrusion	Avoidance
Mean	21.45	11.60	21.85	13.32	17.24	11.76
Standard deviation	7.67	5.35	8.26	5.87	9.28	5.44
Skewness	-0.51	-0.48	-0.59	-0.77	-0.00	-0.46
Kurtosis	-0.22	-0.53	-0.26	-0.54	-0.88	-0.62

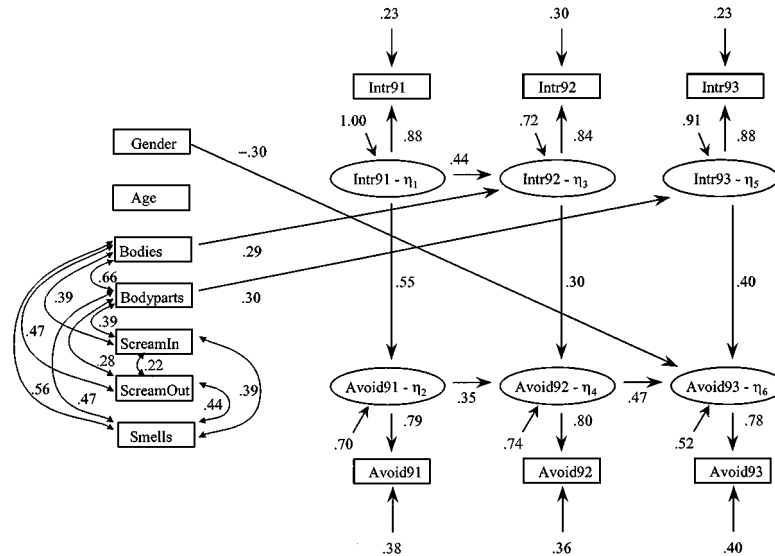


Fig. 1. A structural equation model with sensory exposure, gender, and age as exogenous variables and intrusion 1991–1993 and avoidance 1991–1993 as endogenous latent variables.

intrusion in 1993, and a relation between gender and avoidance in 1993 (boys report a lower degree of avoidance than girls). In addition to these findings, there were relations between intrusion and avoidance on all three time points, with the largest relation in 1991. There were some stability in reactions: intrusion in 1991 to intrusion in 1992, avoidance in 1991 to avoidance in 1992, and avoidance in 1992 to avoidance in 1993. There was no statistically significant relation between intrusion in 1992 and intrusion in 1993. Variance analyses presented earlier confirmed this finding.

There was a good fit between data and model, with $\chi^2(58, N = 91) = 58.83$, *ns*. A GFI index equal to .91 also indicates a good fit in this sample. However, the AGFI = .86, a measure that takes the parsimony into account, is somewhat low. The standardized RMR = .09 is acceptable. RMSEA (ϵ) = .01, with $\epsilon_l = .00$, and $\epsilon_u = .07$ ($\epsilon_{\leq .05} = .83$) reveal a very good point estimate, but the confidence interval is quite wide because of a small

sample size. Its lower bound is in perfect fit and its upper bound in fair fit. The probability of getting close fit in the population is 83%.

Grief Scores

In Table 4 the percentages of girls and boys endorsing various grief reactions in 1993 are shown. On three items girls reported significantly more reactions than boys (dreams about the lost one, crying about the lost one, thinking about the lost one). Thinking about the lost one is the most frequent reaction in both groups, while “anger” comes second for girls, and “thinking he saw the person again” is the second most frequent endorsed item among boys.

It should be noted that there were no significant differences in the number of family members or friends lost by girls versus boys. A grief score based on the six items

Table 4. Grief Reactions in Girls and Boys at 2-Year Follow-Up

	Never/rarely % (n)	Sometimes/always % (n)	Never/rarely % (n)	Sometimes/always % (n)	Chi-square
Dreams about lost ones	74 (32)	26 (11)	50 (20)	50 (20)	5.28*
Thought he/she saw person(s) again	42 (18)	58 (25)	35 (14)	65 (26)	0.41
Cried about lost ones	67 (29)	33 (14)	48 (19)	52 (22)	3.82
Thought about lost ones	40 (16)	60 (24)	8 (3)	92 (36)	11.28***
Changed games because of lost one	63 (25)	37 (15)	47 (18)	53 (20)	1.80
Angry when thought of lost person(s)	53 (23)	47 (20)	38 (15)	62 (24)	1.86
Felt he/she wanted to be like person	55 (23)	45 (19)	50 (19)	50 (19)	0.18
Time passing or making new friends helped feel better	33 (14)	67 (29)	55 (23)	45 (19)	4.26*

* $p < .05$. *** $p < .001$.

correlated significantly ($r = .58, p < .001$) with IES intrusion scores in 1993, but not with avoidance ($r = -.09, ns$).

Discussion

The results reveal a highly distressed population of children who continue to experience sadness over time, remain afraid of losing their family, and feel that friends and family do not really understand what they are going through. A majority did not talk with their parents about their feelings. Although many worry that they may not live to adulthood, they have become more optimistic about the future over time. Both intrusive thoughts and impressions from the war, as well as avoiding thinking and behavior bother the children. Although there was no significant decline in intrusive and avoidance reactions from 6 months to 1 year following the war, there was a reduction in these types of reactions 2 years after the war. The decrease in the older children's intrusion scores (14–17 years old) was greater than for the two other age groups.

There was a tendency for reactions to be most frequent at time 2 (1992), which was close to the 1-year anniversary of the bombing. Anniversary reactions are common among bereaved and traumatized people (Gabriel, 1992; Musaph, 1990). In addition, the war events of the previous year, especially the bombing of the shelter, were featured in many television programs as well as in plays acted out in the area near the Al Ameriyah-shelter. These programs and plays were strong reminders of the event of the previous year.

Nader et al. (1993) documented the impact of seeing horrible death, blood, and mutilation on television on the symptoms and severity levels of Kuwaiti children during the Gulf crisis. Nader and Pynoos (1993) have observed that children previously exposed to catastrophic violence at school experienced a renewal of symptoms following exposure to stories or reports of bloody injury on television. The frequent use of graphic images from the bombing of the shelter at the anniversary probably contributed to reaction levels at this time point.

Around 80% of the children experienced levels of traumatic stress that exceeded the cutoff threshold suggested for cases that meet the criteria for a PTSD diagnosis. The percentage remained fairly stable over the three time points. Without a clinical interview providing an independent diagnosis of PTSD, it is impossible to state that those above the cutoff point had PTSD. The high percentage of children scoring above the cutoff point do, however, reflect that a majority of children are harboring high, stable levels of psychological distress over time.

The near absence of gender differences on the IES was surprising, as several other studies from war situations have documented higher levels of reported distress in girls than boys (Dyregrov, Gupta, Gjestad, & Mukanoheli, 2000; Kuterovac et al., 1994). There are no obvious explanations for this. If it reflected a more equal level of reporting distress among girls and boys in this culture, one would not expect girls to report more grief reactions as was the finding here. It might be that girls admit more grief symptoms than boys in the Arab culture. The discrepancy may also be explained by the statistical methods used and the different conceptual frames used for studying the gender variable. This finding merits further study.

Younger children were less bothered by intrusion than older children. Ahmad (1992) found that a variety of symptoms were more frequent among older (>11 years) than younger Kurdish children (<11 years) exposed to a military attack. The younger children may also be more protected from traumatic sights by their parents or by less interest in attending to such a scene and thus evidence less intrusion from exposure. This effect was not statistically significant when exposure variables and gender were controlled for in the SEM-analysis, indicating that the relation found with univariate analysis is not robust when controlling for other variables.

The drop in intrusion by the oldest children (age 14–17) from time 2 to time 3 in the present study may reflect an increased ability with age to handle the intrusive material, take control over it, or enter into activities that take thoughts away from the war events. There is an age-related increase in children's ability to identify and use cognitive strategies to alter emotional states (Altshuler & Ruble, 1989). Trauma research is inconclusive regarding vulnerability and age, showing both younger children (Eth & Pynoos, 1985; Kostelny & Garbarino, 1994) and older children (Gleser, Green, & Winget, 1981) as most vulnerable. The results reported here indicate that although younger children initially evidence less distress, with the passage of time older children (>14–17 years) evidence the greatest reduction of distress, suggesting the existence of more effective cognitive strategies to deal with stress in this age group. It may also be that adolescents use resources outside the family (friends) better than younger children.

It is interesting that there was no relation between exposure and intrusion in 1991. However, other analyses not reported here found a relation between exposure to combat and this intrusion variable. An explanation of this finding could be that the children were preoccupied with other traumas before the bombing of the shelter or that the trauma in focus was so intolerable that the children did not experience this form of reaction until later (or both). As in

all modeling, it is important to note that a model never can be proven. Goodness of fit indexes supported this model. However, this finding does not indicate that other models (or ways of understanding our data) could not have fitted data equally well or better.

The findings from the structural equation modeling (SEM) are somewhat different from the other analyses in this article. Some of the findings from the analysis of variance did not turn up significant within our model. The reason is a higher statistical control with a SEM-analysis than with separate analysis of variance. The estimated relations in SEM-analysis controlled for other variables in the model and therefore are more robust. In the SEM-analysis, we did not use the shortened IES-scale, but instead controlled for measurement error in the scales and also computed an average factorloading for each reaction-scale (IES-I and IES-A). This use of two different measures of intrusion and avoidance in the analyses may also explain the different results.

The relationship between exposure and distress or symptomatology was not as high as we expected from previous studies (cf. Bradburn, 1991; Nader et al., 1993; Pynoos, Frederick et al., 1987). Sensory exposure was not assessed in detail until the last interview, and it may be that memory mechanisms reduced the chance of finding such a relationship. Pynoos and Nader (1989) found that children exposed to danger experienced memory disturbances following the event leading to recalling greater proximity to the event by those who were most distant, and lesser proximity in those more directly exposed to sniper fire. Such mechanisms may have confounded our measurements as several years elapsed before we assessed exposure in more detail.

More than 2 years following the loss of their friends (some children also lost family members) a large proportion of both males and females endorsed items reflecting grief. Girls reported a higher percentage of reactions on all items, although the two genders had lost the same amount of friends. The higher scores in girls may reflect that friends harbor a more central position in girls' personal life. Girls usually develop a more confiding, intimate relationship to their friends than boys (Rawlins, 1992).

As 91% claim to have lost close friends, there is reason to believe that some form of idealization of the dead is present, and little is known about how this factor influence grief reactions. Such idealization is more common in children than adults (Nader, 1997), and may also be augmented by the martyr status given by muslims to those that are killed during warfare.

Compared to children in Pynoos, Nader, et al.'s study (grief reactions one year following a sniper attack on

a school ground where one child was killed and many were wounded), the Al Ameriyah children reported much higher grief scores (Pynoos, Nader, et al., 1987). This is understandable, as the magnitude of losses was greater in the shelter area compared to the schoolground event. Few children in the shelter area had their network of friends intact, and school and play activities reminded them of the friends they had lost. Continuing thoughts of the deceased and other traumatic reminders (i.e., media coverage) can lead to traumatic reexperiencing or arousal symptoms (or both). As a majority of children continue to experience such distress, and little trauma recovery work has taken place, this may explain why so many children continue to grieve more than 2 years after the shelter bombing.

The interviews gave insight into the potential for disastrous psychic injury for children who experience war-disasters such as the shelter bombing. There was no safe place for them, and they expected the worst to happen again. The threats of and actual new military attacks, the presence of military air activity, and the ongoing sanctions made it difficult to forget the events and painful to remember them.

Intrusive thoughts have been found to have a triggering role not only in PTSD but in the onset of depressive and anxiety disorders as well (McFarlane, 1992). Avoidance phenomena are preceded by intrusion, and believed to be a defense against the recurrent memories of the trauma. On the basis of empirical data, Creamer, Burgess, and Pattison (1990) have suggested that the IES is more a measure of cognitive processing of an event, than a measure of distress, and that cognitive processing does not take place effectively under conditions of high cognitive arousal. They argue that the intervening variable between exposure and psychiatric impairment is the individual's capacity to process or integrate the event. For this integration to take place the levels of cognitive arousal, as reflected by intrusion scores, must not be excessively high, and avoidance must be low enough to allow activation of the fear structure to be processed. The continuing high levels of intrusion and avoidance among the Iraqi children may render them less able to process the trauma, and place the children at risk for psychiatric impairment.

Generally, the adult culture did not seem to stimulate the expression of feelings and thoughts about war events. The common procedure followed by many parents in Iraq was to tell the children to forget, put what happened behind them and disregard what they had experienced. The interviews gave the impression that this attitude left the children alone with their grief and distress. Discussion, open expression, and providing facts about the war-events were seldom stimulated, as reported in research from other war areas (Zivcic, 1993). Adult

denial is well known from disaster areas (Earls, Smith, Reich, & Jung, 1988; Handford, Mattison, Humphrey, & McLaughlin, 1986; Kinzie, Sack, Angell, Manson, & Rath, 1986; Yule & Williams, 1990). Children soon understand that the adult world is unable to acknowledge their reactions, and they follow the direct and indirect example from the adult world. It added to the problems in Iraq that adults often were deeply affected by the psychological effects of the bombing and the war. Many children said that they could not talk with their parents because this made their parents upset. Parent's preoccupation with their own situation made them less ready to discuss feelings and worries with their children, adding to the already existing cultural norms for not talking. Although parents are regarded as the best "protective" factor in adverse situations that happen to children (Kalantari, Yule, & Gardner, 1993; Zivcic, 1993), this factor is often less available following traumatic events, leaving children more alone to cope.

Conditions for research will never be ideal during or following war. The preparation for and undertaking of the first visit to Iraq was made under great time and practical pressure, leaving much to desire concerning instruments, field-testing of instruments, etc. With more thorough preparation the methodological quality would have been improved. The two follow-up visits were also burdened by logistical difficulties. When viewing the available data, it should be kept in mind that they were collected under warlike conditions, where the resources and practical situation did not allow for the methodological rigor possible in nonwar societies.

The results of this study add to the increasing empirical evidence from nonwar (Green et al., 1994; McFarlane, Policansky, & Irwin, 1987; Pynoos & Nader, 1989; Terr, 1983) to war situations (Sack et al., 1993) that posttraumatic stress reactions in children and adolescents persist. The symptoms persist, but their intensity is somewhat diminished over time. However, the events continue to influence the children and adolescents and may affect their development of personality, moral values, and outlook on life. The psychological impact of war is not over when the fighting ceases.

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