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Age, education, maltreatment, and social support as predictors of chronic depression in former prisoners of war*

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Summary. This study examined the relationships of prisoner of war captivity trauma variables and individual protective variables to current depressive symptoms as indexed by the CES-D and its components. The sample consisted of 989 U.S. former POWs of World War II and the Korean War, who have been followed since the mid 1950s. Depressive symptoms persisted over 40 years later. Age, education, medical symptoms during captivity, and level of social support were related to later levels of adjustment. Theoretical and methodological implications of the findings were discussed.

Former prisoners of war (POWs) are a large group who survived the traumatic experiences of military captivity. Their study has relevance to them and survivors of other captivity maltreatment (Engdahl and Eberly 1990), and provides insights into the phenomenology of general posttraumatic adaptation. Although some studies have found few long-term negative effects and even psychological growth among POWs (Sledge et al. 1980; Ursano 1981), most studies indicate that POWs are at increased risk for persisting psychiatric symptoms and disorders (Ursano 1990). When compared with non-POW combat veterans, World War II Pacific theater POWs and European theater POWs were four to five times more likely to have been hospitalized for psychoneurosis following discharge from service (Cohen and Cooper 1954). Fifteen to twenty years later they continued to be more frequently hospitalized for a variety of psychiatric illnesses, including anxiety, "nervousness and debility", schizophrenia, and alcoholism (Beebe 1975). When studied again in the mid-1980s, these POWs reported rates of depressive symptoms on the Center for Epidemiologic Studies-Depression scale (CES-D; Radloff 1977) that were much higher than CES-D general population values and the values found among their non-POW controls (Page 1988). The POWs' CES-D values most resembled those found in clinical samples of recovering depressives.

Psychiatric symptoms, particularly depressive symptoms, were elevated among Australian World War II POWs in a recent series of studies (Tennant et al. 1986 a, b; Dent et al. 1987). Examination of 170 POWs and comparable non-POW controls revealed that POWs were significantly more depressed some 40 years after repatriation. No differences were found in state anxiety, trait anxiety, neuroticism, psychoticism, or hostility. Separate regression analyses showed the following variables to be predictive of present-day depressive symptoms for POWs *and* controls: experiencing a nervous illness during World War II or a depressive illness after World War II, having a lower level of education or socioeconomic status, and being unmarried, unemployed, or retired (Dent et al. 1987).

The present study draws on the national longitudinal study of American POWs sponsored by the Department of Veterans Affairs (VA) and conducted by the National Academy of Sciences. It examines the relationships of captivity trauma and individual protective variables to current depressive symptoms as indexed by the CES-D and its components.

Method

Subjects

The Medical Follow-up Agency of the Institute of Medicine, National Academy of Sciences, has studied the health of former POWs since the early 1950s (Cohen and Cooper 1954; Beebe 1975; Page 1988). The present questionnaire follow-up began with a review of VA mortality records, which ascertained that 1.319 men from the earlier studies were alive as of mid-1984 and thus eligible for the study. Under an arrangement with the National Institute for Occupational Safety and Health, the Internal

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Table 1. Center for Epidemiologic Studies-Depression scale items experienced during the past week, grouped into four factors

Negative affect:
I felt depressed (6)
I felt sad (18)
I felt that I could not shake off the blues, even with the help of my family or friends (3)
I felt lonely (14)
I thought my life had been a failure (9)
I felt fearful (10)
I had crying spells (17)
Positive affect:
I enjoyed life (16)
I was happy (12)
I felt hopeful about the future (8)
I felt that I was just as good as other people (4)
Somatic symptoms:
I felt that everything I did was an effort (7)
I could not get "going" (20)
I was bothered by things that usually don't bother me (1)
I had trouble keeping my mind on what I was doing (5)
My sleep was restless (11)
I talked less than usual (13)
I did not feel like eating; my appetite was poor (2)
Interpersonal problems:
I felt that people disliked me (19)
People were unfriendly (15)

Item numbers are given in parentheses. Weighting of item responses: 0 = rarely or none of the time (less than 1 day); 1 = some or a little of the time (1–2 days); 2 = occasionally or a moderate amount of the time (3–4 days); 3 = most or all of the time (5–7 days).

Revenue Service provided addresses for roughly 90% of the sample, and two commercial tracing firms provided addresses for an additional 3%. Next, up to three mailings per person were made to each address, with a mailgram preceding the third mailing to alert the addressee to the forthcoming questionnaire. The mailings contained a cover letter from the study director at the time, Robert Keehn, the 20-item CES-D, and other questionnaires about health and adjustment. Included in the third mailing was a letter from the National Commander of the American Ex-POWs encouraging participation in the study. Mailings began late in 1984 and replies were accepted through December 1985. The total number of responses received was 989. After excluding deceased subjects discovered by survey, the final response rates were 74.5% for the Pacific, 75.3% for the European, and 68.8% for the Korean POWs. Respondents differed little from non-respondents (Page 1988), although non-respondents had completed slightly less education than respondents.

Measures

The CES-D is a standardized self-administered rating instrument and was chosen as a measure of depressive symptoms, which are known to be elevated among POWs (Tennant et al. 1986a). The CES-D is well suited to estimate the severity and prevalence of depressive symptoms among the general population of POWs, as it is widely used in epidemiologic studies of the prevalence and correlates of depression in non-clinical populations (e.g., Murrell et al. 1983; Weissman et al. 1977). The use of the CES-D allowed a large number of subjects to be surveyed and permitted comparisons with previous CES-D-based general and special population surveys. Community studies found the proportion of older males with high CES-D scores (at or above the cut-off point of 16) to range from 3% to 18%, with an average of roughly 10% (Comstock and Helsing 1976; Frerichs et al. 1981; Murrell et al. 1983; Eaton and Kessler 1981).

The CES-D may be viewed as a measure of general psychological impairment, primarily indexing depression. Although CES-D scores correlate modestly with clinical diagnoses of depression (Myers and Weissman 1980; Boyd et al. 1982), the CES-D does not yield a diagnosis. Its primary utility is in the estimation of symptom prevalence and in clinical or research efforts as a first-stage screening test. The CES-D total score reflects anxiety as well as depression (Breslau 1985; Roberts et al. 1989). Each of the 20 CES-D items is assigned a score of 0 to 3, with the positive affect (see below) items reversed in sign. All response values are summed resulting in scores that range from 0 to 60. The standard indication of significant depressive symptoms is a score of 16 or above. We assigned missing item responses a value of 0, and 5 or more missing responses on a single questionnaire resulted in the assignment of a missing CES-D total score for that person.

Four factors best represent the CES-D's content: negative affect (NA), positive affect (PA), somatic symptoms and retarded activity (SO), and interpersonal problems (IP). These factors have been found repeatedly in samples varying in sex, age, race, and geographic location (Radloff 1977; Clark et al. 1981; Golding and Aneshensel 1989). The CES-D items are shown in Table 1 grouped according to these factors. Items' correlations with their respective factor scores were calculated for the present sample and used to rank them in descending order within their factor groups. Therefore, in this sample, NA is most strongly characterized by feeling depressed, sad, and "blue"; PA by feeling happy, and enjoying life; SO by feeling that doing everything is an effort, being easily bothered, and concentration problems; and IP by perceptions of others as unfriedly. Scores on NA, PA, SO, or IP factors were treated as missing when one or more of the factor's items had a missing response.

We also used data from the 1965 survey of these POWs originally reported by Beebe (1975). These data include a self-report checklist of medical problems and symptoms experienced during captivity, shown in Table 2. A total Captivity Symptoms score was calculated by summing the number of "yes" responses to each item on the list. Percent of body weight lost during captivity was calculated from 1965 self-report data and is the difference between weight at induction and the lowest weight during captivity, divided by weight at induction.

Several studies have established the importance of social support and social integration in post-trauma adjustment (Keane et al. 1985; Solomon et al. 1989; see Flannery 1990 for a review). We derived an index of social support for our sample through factor analysis of 4 items concerning post-repatriation adjustment drawn from the 1965 sur-

Table 2. Captivity medical problems and symptoms experienced by POW groups

Captivity problems and symptoms	POW group		
	Pacific	Europe	Korea
	Percent experiencing the problem		
Malaria	73.2	2.0	26.6
Diarrhea lasting 1 week or more	79.6	38.2	76.1
Blood or mucous in stool	89.7	50.0	88.8
Physician-diagnosed dysentery	61.3	14.7	28.0
Swelling of lower limbs	84.7	23.1	56.3
Swelling in feet or ankles	60.3	30.2	57.2
Persistent night vision problems	28.5	6.5	45.5
Continuous pain or burning in eyes	31.7	10.5	19.9
Blurred vision	47.8	14.4	36.3
Eye pain in bright light	41.7	13.4	31.6
Loss of vision, one or both eyes	18.0	1.0	12.7
Red, raw scrotum	44.2	5.0	12.2
Deep cracks, corner of mouth	51.4	10.0	32.3
Persistent severe, sunburn	14.9	1.5	1.7
Red, swollen, bleeding gums	40.9	15.9	35.6
Tongue pain inhibiting eating	47.0	6.5	35.1
Painful feet	72.4	37.8	60.7
Pain in leg muscles when squeezed	46.1	17.4	33.3
Cramps in feet and legs	59.9	31.8	51.0
Breasts enlarged	14.1	0.5	5.0
Symptom Index mean	9.45	2.55	6.76
Distribution of weight loss			
>45%	27.9%	3.1%	22.8%
36–45%	37.4	13.4	32.5
26–35%	23.8	28.4	24.4
16–25%	9.6	36.1	11.9
≤15%	1.4	19.1	8.4
Mean percent weight loss	38.8%	24.3%	35.1%

Numbers of subjects = 371 (Pacific); 209 (Europe), 409 (Korea) except for weight loss data where $n = 366$ (Pacific), 194 (Europe), 394 (Korea)

vey (factor score weights are given in parentheses): perceiving that the VA or military could have done more to help with return to civilian life (0.593), reporting that social activities were typically solitary in the first year after the war (0.703); perceiving the return to civilian life to be difficult (0.765), and reporting that old friendships were easily picked up after the war (−0.804). A principal components factor analysis rotated to a varimax criterion was used. Social support is the weighted sum of an individual's responses to these items.

Results

CES-D scale

The CES-D total score mean was 13.79 (s.d. = 12.88). This is markedly high when compared to figures for the general population where normal groups average 5 to 8 (National Center for Health Statistics 1980). Psychiatric samples have shown mean scores ranging from 37 for male acute depressives to 19 for male recovered depressives (Weissman et al. 1977). The POWs' CES-D component scores also were elevated when compared to those for 412 adult males drawn from the Los Angeles county general population (Clark et al. 1981) and shown in parentheses: NA = 4.78 (2.05), PA = 7.60 (1.72), SO = 9.81 (3.39), and IP = 0.93 (0.47).

Correlates of depressive symptoms

We sought predictors of CES-D scores among a number of captivity and demographic (antecedent) variables. We assumed both the existence of a dose-response relationship between severity of trauma and the post-traumatic depressive symptoms, and the presence of individual variables that might moderate a dose-response relationship.

Crosstabulation analyses (not shown) revealed similar proportions of men with high CES-D scores across the three POW groups when comparing men who reported the same range of weight loss or captivity symptom score. This suggests that more severe treatment as reflected both by greater weight loss and greater number of captivity symptoms is linked to a higher level of subsequent depressive symptoms, and that differences in severity of treatment will at least partially explain the differences in CES-D scores.

We estimated the combined effects of antecedent variables on CES-D scores through multiple regression analyses, treating the CES-D total score and the CES-D component scores as dependent variables. The rationale for antecedent variable selection was based on previous research, particularly the studies of Australian POWs. We examined the roles of the following antecedent variables: race, rank at capture, marital status at entry into active duty, age at time of capture, years of education, Army General Classification Test (AGCT) score, weight loss in captivity, and captivity symptom score. We treated all but marital status, rank at capture, and race as continuous variables, with rank at capture assigned three ordinal categories (highest to lowest): commissioned officers, sergeants and corporals, and privates. We divided marital status into two categories: married and unmarried (single, separated, or divorced); and coded race into two categories: white and nonwhite.

Antecedent variable intercorrelations for the sample are shown in Table 3. Not surprisingly, moderately high positive values were noted between rank at capture and age at capture ($r = 0.445$), rank at capture and years of education ($r = 0.456$), AGCT score and years of education ($r = 0.430$), and weight loss with captivity symptom score ($r = 0.576$). Medical symptoms reported during captivity were unrelated to age and education. As will be shown below in the multivariate analyses, CES-D component scores share substantial variance with each other.

We used a stepwise elimination approach to multiple regression analysis, beginning with all antecedent variables included as predictor variables in each of five equations: the first predicting the CES-D total score and the other four predicting the CES-D component scores. Antecedent variables not significantly predictive of *any* CES-D scores ($P < 0.01$) were dropped and equations

Table 3. Intercorrelations of the POW experience factors and CES-D components

Race	–								
Rank at capture	−0.144	–							
Marital status	ns	0.196	–						
Age at capture	ns	0.445	0.313	–					
Education at capture	ns	0.456	0.099	0.193	–				
AGCT score	ns	0.214	ns	0.171	0.430	–			
Weight loss	ns	ns	ns	ns	−0.098	ns	–		
Captivity symptoms	ns	ns	ns	ns	ns	ns	0.576	–	
Social support	ns	0.187	ns	0.150	0.148	ns	ns	−0.299	–
	Race	Rank	Marital	Age	Education	AGCT	Weight loss	Symptoms	Support

Note: ns = not significant; for race, 1 = caucasian, 2 = all other. For marital status, 1 = single, 2 = other. For explanation of other variables, refer to text. All values shown are significant at $P \leq 0.001$ via 2-tailed test

Table 4. Multiple regression prediction of CES-D total and component scores for POWs 30 to 40 years after release

CES-D Component	R	Age at capture	Education	Captivity symptoms	Social support	Canonical loading	*n*
Total score	0.33	−0.10	−0.12	0.16	−0.17	–	989
Negative affect	0.43	−0.12	−0.15	0.22	−0.22	0.88	902
Positive affect	0.32	0.09	0.16	ns	0.17	−0.63	911
Somatic symptoms	0.45	ns	−0.13	0.28	−0.22	0.95	885
Interpersonal problems	0.34	−0.09	−0.16	0.09	−0.21	0.70	922
Canonical loading		−0.33	−0.49	0.70	−0.76		

Note: R = multiple regression coefficient. Standardized regression weights displayed are significant at $P \leq 0.01$ via 2-tailed test

were recalculated. Length of captivity had too many missing observations to be included in any of our analyses. Rank at capture and AGCT score data frequently were missing for the Pacific and European POWs, and race was white only in these two groups. Thus values for rank at capture, AGCT score, and race were available primarily for the Korean POWs. None of these three variables was significant and they therefore were omitted from further analyses.

The multiple regression results presented in Table 4 generally fit one pattern: being younger at the time of capture, having less education at the time of capture, experiencing more medical symptoms during captivity, and experiencing less social support in the year after release were predictive of long term maladjustment (higher NA, SO, and IP plus lower PA). There were two exceptions to this pattern: age at capture was not predictive of SO and captivity symptoms were not predictive of PA. To define the most predictable criterion set, the results of a canonical correlation analysis are included in Table 4. The first variate was the only significant one ($\chi^2 = 34.08, P < 0.001$). The weighting of the variables in this variate indicates that high levels of captivity medical symptoms and low social support are particularly predictive of later elevated NA and SO scores.

Discussion

To explain the persistence of depressive symptoms for 40 years after POWs' release from captivity investigators have suggested that, over the long follow-up period, anxiety may diminish but depression may increase as a reaction to chronic post-traumatic impairment (Dent et al. 1987). In addition, pathological CES-D scores may not indicate dysthymia or major depression, but another psychiatric disorder. PTSD and generalized anxiety disorder are specifically known to occur with elevated frequencies among POWs. Retrospective diagnosis of psychiatric disorders among 188 World War II and Korean conflict POWs indicated that within one year of their release, 67% fulfilled DSM-III criteria for PTSD and more than half of them continued to have symptoms over 40 years later (Kluznik et al. 1986). Generalized anxiety disorders and depressive disorders also were frequent. Depressive symptoms are an associated feature of PTSD and major depression shares three diagnostic criteria with PTSD-loss of interest in activities, sleep disturbance, and impaired concentration.

A further study of the present sample is in progress and includes assessment of both PTSD and depression by questionnaire and by direct examination. The results, when linked with data collected over the last 40 years, should help clarify the patterns of POWs' long-term reactions to their captivity experiences. The interplay of captivity and demographic variables with post-trauma syndromes over time should reveal important aspects of the natural course and duration of post-trauma syndromes.

Captivity maltreatment, indexed in this study by captivity symptoms, has been clearly linked to later maladjustment (Engdahl and Eberly 1990). Protective variables have less often been linked to later adjustment. Although studies have shown the importance of social support in post-trauma adjustment, the positive roles that other protective variables (e. g., age, education at capture) can play in post-trauma adjustment have only been postulated

(Kolb 1989). Studies which focus on those who adjusted well and exploration of the roles of protective variables should increase our understanding of post-trauma adjustment and resiliency.

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