Traumatic Dissociation as a Predictor of Posttraumatic Stress Disorder in South African Female Rape Survivors

Jani Nöthling, MA, Kees Lammers, MA, Lindi Martin, MA, and Soraya Seedat, PhD

Abstract: Women survivors of rape are at an increased risk for posttraumatic stress disorder (PTSD). Traumatic dissociation has been identified as a precursor of PTSD. This study assessed the predictive potential of traumatic dissociation in PTSD and depression development.

The study followed a longitudinal, prospective design. Ninety-seven female rape survivors were recruited from 2 clinics in Cape Town, South Africa. Clinical interviews and symptom status assessments of the participants were completed to measure dissociation, childhood traumas, resilience, depression, and PTSD.

Traumatic dissociation was a significant predictor of PTSD and depression. The linear combination of prior dissociation, current dissociation, and resilience significantly explained 20.7% of the variance in PTSD. Dissociation mediated the relationship between resilience and PTSD.

As traumatic dissociation significantly predicts PTSD, its early identification and management may reduce the risk of developing PTSD. Interventions focused on promoting resilience may also be successful in reducing the risk of dissociation following rape.

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Abbreviations: CD-RISC = Connor–Davidson Resilience Scale, CESD = Center for Epidemiologic Studies Depression Scale, DES-T = Dissociative Experiences Scale—Taxon, ETISR-SF = Early Trauma Inventory Self Report—Short Form, HIV = human immunodeficiency virus, MINI = Mini International Neuropsychiatric Interview, PCL-C = PTSD Checklist Civilian version, PTSD = posttraumatic stress disorder.

INTRODUCTION

Posttraumatic stress disorder (PTSD) is often associated with rape and sexual assault.[1–4] Rape is a commonly reported criminal offence in South Africa. From 2011 to 2012, 66,387 sexual crimes were reported to the South African Police

Services with many going unreported.[5] Rape and other forms of sexual assault are more prevalent among women who, compared with men, are more likely to develop PTSD following a traumatic event.[6–10] Survivors of rape and other types of sexual assault are at a higher conditional risk of developing PTSD relative to survivors of other trauma types.[6,11] Women survivors of rape are, therefore, a particularly high-risk group for the development of PTSD.

Across trauma types, traumatic dissociation has been identified as the largest predictor of PTSD in a review of PTSD risk factors.[12] It has also been identified as a predictor of PTSD in a number of individual studies.[13–17] Other risk factors for PTSD include a personal history of psychiatric treatment[12,18,19]; perceived life threat during the trauma,[12,19] prior traumas, and multiple traumas[6,20]; childhood abuse[6,21,22]; and sexual abuse.[6,22]

Traumatic dissociation can be defined as a tendency to dissociate soon after trauma and includes feelings of depersonalization, derealization, detachment from others, and reduced responsiveness to surroundings.[13,23] Dissociation interferes with the processing of the trauma that leads to poor mental representation of the trauma in memory.[14,24] Poor integration of trauma memories can lead to intrusive phenomena (eg, flashbacks) and ultimately PTSD.[13,14,23,24]

Both prior trauma and multiple traumas have also been identified as risk factors for traumatic dissociation.[6,25] Interpersonal violence survivors and survivors of multiple traumas display higher levels of PTSD and traumatic dissociation compared with survivors of natural disasters and bereaved individuals.[6] For example, victims of repeated sexual abuse report higher levels of dissociation and PTSD symptoms than those with a history of child sexual abuse alone.[11] Moreover, childhood sexual abuse[11,26–28] and childhood physical abuse[27,28] are significant predictors of adult sexual abuse and revictimization. As such, individuals with multiple traumas are significantly more likely to develop PTSD and dissociation may be a mechanism through which PTSD develops.[11,26,29]

In addition to PTSD, depression is often diagnosed in individuals who have experienced a trauma.[30–32] Rape, interpersonal, and sexual violence have been identified as risk factors for comorbid PTSD and depression.[1,21,33] Women who have experienced intimate sexual violence are 4 to 5 times more likely to suffer from depression and anxiety.[33] Depression and PTSD are also significant predictors of suicidal ideation in sexual assault survivors and women with a history of sexual assault are more likely to attempt suicide during their lifetime.[34]

As the majority of trauma survivors do not go on to develop PTSD, posttrauma protective factors and, in particular, resilience are thought to be salient.[35] Protective factors against the development of PTSD in rape and sexual assault survivors include positive social support,[22,36–38] strong religious beliefs,[39] positive coping styles,[38,40,41] self-efficacy,[41,42] parental affection,[18] high internal locus of control,[41] and the finding of meaning in the experience.[37,39] Various studies have

found a link between unresolved attachment (in adults), disorganized/insecure attachment (in infants), and increased likelihood of traumatic dissociation and PTSD symptom severity.[43–48] Insecure attachment is related to social withdrawal and a lack of confidence in exploring new relationships and eliciting support from others, which leads to lower levels of social support following trauma.[46,49] Social support can, in turn, serve as a protective factor against the development of PTSD, but a lack of social support can also serve as a risk factor for the development of PTSD.[49]

The primary objective of this study was to determine the predictive potential of traumatic dissociation in the development of PTSD at 2 months post-rape while controlling for dissociation prior to the rape. We also assessed the predictive potential of resilience and past childhood traumas in PTSD development. The secondary objectives were to determine the predictive potential of dissociation, resilience, and childhood trauma in the development of depression at 2 months post-rape and the predictive potential of resilience and childhood trauma in dissociation at 2 months post-rape.

METHODS

Participants

To be eligible, participants had to be at least 14 years old. Participants were excluded from the study if they had a primary diagnosis of substance abuse or dependence or if they met criteria for PTSD, depression, or other psychiatric or general medical conditions at the screening visit that warranted referral and/or treatment. Participants were recruited from January 2008 to June 2012 at the M5 Rape Clinic at Karl Bremer Hospital in Parow, Cape Town, South Africa, and at the Thuthuzela Rape Clinic at GF Jooste Hospital in Manenberg, Cape Town. These centers serve as a 1-stop facility and offer medical and forensic examinations; on-site counseling (provided by social workers or nurses) and referrals for long-term counseling; follow-up medication visits (this includes human immunodeficiency virus [HIV] prophylaxis and treatment of sexually transmitted infections); transportation to home or a place of safety; and court preparation and trial follow-up.

Study Design

The study followed a prospective, longitudinal design. Assessments were completed at 3 time periods, namely, within 2 weeks (visit 1), 1 month (visit 2), and 2 months (visit 3) after the rape. Participants were encouraged to attend all 3 assessments, at a time and date convenient to them and the researcher, to avoid dropout. The study was approved by the Committee for Health Research at Stellenbosch University in Cape Town, South Africa (N08/02/040).

Procedures

Participants were either directly approached to participate, referred by staff at the rape clinics, or were contacted via telephone. Informed consent was obtained in the preferred language (English or Afrikaans) from all adult participants and from a parent in the case of adolescent participants (<18 years). Participants completed a series of self-report questionnaires and measures at each visit—Visit 1: demographic questionnaire, the Dissociative Experiences Scale – Taxon (DES-T) for current dissociation and dissociation during the trauma, the Early Trauma Inventory Self Report – Short Form (ETISR-SF), the Connor–Davidson Resilience Scale (CD-RISC), and the Center for Epidemiologic Studies Depression Scale (CESD); Visit 2:

DES-T for current dissociation and dissociation prior to the trauma as well as the CD-RISC and the PTSD Checklist Civilian version (PCL-C); and Visit 3: DES-T for current dissociation, the CD-RISC, CESD, and the PCL-C. The Mini International Neuropsychiatric Interview (MINI) for adults and the MINI KID for adolescents were administered by a researcher, trained in its use, at all 3 visits. Participants were reimbursed for their travel expenses at each visit.

MEASURES

Demographic Questionnaire

This captured demographic information on age, sex, ethnicity, language, and education. The questionnaire also included questions related to trauma (eg, previous sexual assault history, the relation of the participant to the perpetrator, and the number of perpetrators).

Dissociative Experiences Scale—Taxon

Dissociative symptoms were assessed using the DES-T.[50] The DES-T, derived from the 28-item Dissociative Experiences Scale,[51] is an 8-item subscale designed to discriminate pathological from nonpathological forms of dissociation. The scale focuses on pathological changes in consciousness, such as dissociative amnesia, depersonalization, and derealization. The DES-T, unlike the DES, does not tap into normative dissociative experiences (eg, absorption and imaginative involvement). The 8 items are scored on 100 mm visual analog scales. Higher scores indicate a stronger tendency to dissociate. The scale has a range of 0 to 80. The DES-T is regarded as a valid and reliable (Cronbach α of 0.85 found in the previous study) measure to evaluate dissociation.[52,53]

Early Trauma Inventory Self Report—Short Form

The ETISR-SF was used to screen for previous traumas, occurring before the age of 18 years.[54] The ETISR-SF is a 28-item self-report questionnaire used to measure physical, emotional, and sexual abuse, as well as general traumas. Responses to the items are in a ''yes''/''no'' format. The ETISR-SF has been found to have good reliability (Cronbach α of 0.78−0.90) and validity.[55]

Connor–Davidson Resilience Scale

The CD-RISC was used to assess resilience.[56] The CD-RISC is a 25-item self-report scale. Responses to the items are measured on a 5-point Likert scale ranging from ''rarely'' to ''all the time,'' with participants responding to the 25 items with reference to the past month. The scale has a range of 0 to 100, with higher scores reflecting greater resilience. The CD-RISC has shown good reliability (Cronbach α range: 0.89−0.92) and validity in the previous studies.[56,57]

Center for Epidemiologic Studies Depression Scale

The CESD was used to screen for depression.[58] The CESD is a 20-item self-report scale. Responses are measured on a 4-point Likert scale ranging from ''rarely or none of the time'' to ''most or all of the time.'' Higher sores indicate greater symptom severity. A score of ≥16 is considered indicative of depression. The CESD has shown good reliability (Cronbach α range: 0.85−0.90) and has been validated for clinic and community settings[58−62] and in many cross-cultural samples[63−65] and across ethnic groups.[66,67]

PTSD Checklist Civilian Version

The PCL-C was used to measure PTSD symptom severity.[68] The PCL-C is a 17-item self-report scale. Responses are measured on a 5-point Likert scale ranging from ''not at all'' to ''extremely.'' Higher scores on the PCL-C indicate greater symptom severity and prevalence. A score of ≥50 is considered indicative of PTSD.[69] The PCL-C has shown good reliability (Cronbach α range: 0.75–0.94) in clinical and community settings.[70,71]

Mini International Neuropsychiatric Interview

The MINI for adults and the MINI KID for adolescents[72] were used to assess the prevalence of mental disorders. The MINI and MINI KID are structured psychiatric interviews. Both the MINI and the MINI KID elicit symptoms of 24 major Axis I diagnostic categories, 1 Axis II disorder (ie., antisocial personality disorder), and suicidality. The items used in the MINI and MINI KID are consistent with the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition and International Classification of Diseases, 10th Edition.

Data Analysis

Data were analyzed using SPSS version 20 (SPSS Inc., Chicago, IL). Descriptive statistics were computed to determine sample demographics and the frequency of psychiatric disorders. *t* tests were used to assess the differences between dropouts and participants with complete data as well as the difference between adults and adolescents, for the variables dissociation, childhood trauma, PTSD, depression, and resilience. χ^2 tests were used to assess the differences for the demographic variables, HIV status, previous sexual assaults, number of perpetrators, and if the perpetrator was known to the participant or not.

Bivariate relationships were tested using Pearson correlations. Spearman tests were used where data was not normally distributed. Variables with significant correlations were entered into simple and multiple regression models. At least 10 cases per predictor variable were available for regression analyses. Three multiple regression models were computed. Dissociation at 2 months post-rape was used as the outcome variable in model 1 and dissociation at 2 weeks, prior dissociation, resilience at 2 weeks, and resilience at 1 month were entered as predictors. PTSD at 2 months post-rape was the outcome variable in model 2 and dissociation at 2 weeks, prior dissociation, dissociation at 1 month, and resilience at 2 weeks were predictor variables. Depression at 2 months was the outcome variable in model 3 with dissociation at 2 weeks, resilience at 2 weeks, and age entered as predictors. Two-month data were modeled as outcome variables to ensure that symptoms of depression, dissociation, and posttraumatic stress were not accounted for by acute stress disorder.

RESULTS

Sample Demographics

The sample included 97 female rape victims at visit 1, with a mean age of 25.2 (standard deviation = 7.39) years (range: 14–44). At visit 2 (1 month post-rape), 75 participants had complete datasets and 67 participants had complete datasets at visit 3 (2 months post-rape). Reasons for dropout included relocation and avoidance of trauma-related questioning. Participants were predominantly single (75.3%), >18 years (87.6%), of mixed ethnicity (colored) (74.2%), Afrikaans speaking

(58.8%), and had some secondary schooling (71.3%). Most participants were HIV negative (91.8%), had not experienced a previous rape (66%), knew their perpetrator (58.8%), and had been raped by a single perpetrator (84.5%). Demographic characteristics are shown in Table 1.

TABLE 1. Demographic Layout of the Sample

	N	%
Adult/Adolescent	97	
Adult	85	87.6
Adolescent	12	12.4
Language	97	
English	24	24.7
Afrikaans	57	58.8
Xhosa	16	16.5
Ethnicity	97	
Black	22	22.7
Colored (mixed race)	73	74.2
White	2	2.1
Marital status	97	
Single	73	75.3
Married/living with a partner	18	18.5
Divorced/separated	6	6.2
Annual income	97	
<R 10,000 (<$1019)	9	9.3
R 10,000–R 20,000 ($1019–$2039)	11	11.3
R 20,000–R 40,000 ($2039–$4077)	8	8.2
R 40,000–R 60,000 ($4077–$6116)	4	4.1
R 60,000–R 100,000 ($6116–$10,194)	4	4.1
>R 100,000 (>$10,194)	3	3.1
Unknown	58	59.8
Level of education	94*	
Some primary schooling/completed primary school	7	7.5
Some secondary schooling	67	71.3
Grade 12 completed	9	9.6
Some higher education/higher education completed	11	11.7
HIV status	97	
HIV positive	8	8.2
HIV negative	89	91.8
Previous sexual assaults	97	
Raped once before	12	12.4
>1 previous rape	12	12.4
Other sexual assaults	3	3.1
Raped before and victim of other sexual assaults	6	6.2
Never been raped before	64	66.0
Perpetrator	97	
Known perpetrator	57	58.8
Unknown perpetrator	37	38.1
Unsure	3	3.1
Number of perpetrators	97	
1	82	84.5
2–3	10	10.3
4–6	4	4.1
Unsure	1	1.0

HIV = human immunodeficiency virus.
* Missing data.

TABLE 2. Parameters for the Simple Regressions Models: Variables Predicting Dissociation, PTSD, and Depression

Model		N	Unstandardized		Standardized β-Coefficients	t	Sig.	95% Confidence Interval	
			β	Std. Error				Lower Limit	Upper Limit
A	Dissociation at 2 mo (Constant)	69	1.24	1.56		0.80		−1.87	4.36
	Dissociation at 2 wk	69	0.26	0.05	0.51	4.91	0.000	0.16	0.37
B	Dissociation at 2 mo (Constant)	64	4.17	1.37		3.05		1.44	6.91
	Prior dissociation	64	0.31	0.11	0.33	2.74	0.008	0.08	0.53
C	Dissociation at 2 mo (Constant)	69	25.97	5.17		5.03		15.66	36.28
	Resilience at 2 wk	69	−0.29	0.07	−0.43	−3.90	0.000	−0.43	−0.14
D	Dissociation at 2 mo (Constant)	64	22.44	5.08		4.41		12.28	32.60
	Resilience at 1 mo	64	−0.237	0.07	−0.39	−3.38	0.001	−0.38	−0.10
E	PTSD at 2 mo (Constant)	69	26.54	2.0		13.31		22.60	30.52
	Dissociation at 2 wk	69	0.22	0.07	0.36	3.22	0.002	0.08	0.36
F	PTSD at 2 mo (Constant)	64	27.55	1.61		17.14		24.33	30.76
	Dissociation at 1 mo	64	0.31	0.11	0.35	2.94	0.005	0.10	0.52
G	PTSD at 2 mo (Constant)	64	28.40	1.50		18.92		25.39	31.39
	Prior dissociation	64	0.37	0.12	0.33	2.73	0.008	0.09	0.58
H	PTSD at 2 mo (Constant)	69	47.80	6.40		7.48		35.05	60.54
	Resilience at 2 wk	69	−0.25	0.09	−0.31	−2.73	0.008	−0.43	−0.07
I	Depression at 2 mo (Constant)	69	15.53	1.16		13.35		13.21	17.85
	Dissociation at 2 wk	69	0.11	0.04	0.33	2.84	0.006	0.03	0.19
J	Depression at 2 mo (Constant)	69	26.81	3.70		7.25		19.43	34.18
	Resilience at 2 wk	69	−0.13	0.05	−0.29	−2.52	0.014	−0.24	−0.03
K	Depression at 2 mo (Constant)	69	10.90	3.22		3.39		4.47	17.32
	Age	69	0.28	0.13	0.26	2.21	0.030	0.03	0.54

PTSD = posttraumatic stress disorder. A–D—Outcome: dissociation at 2 mo (DES-T), E–H—Outcome: PTSD at 2 months (PCL-C), I–K—Outcome: depression at 2 months (CESD).

Reliability of Measurement Instruments

All of the instruments showed excellent internal consistency (Cronbach α): DES-T for prior dissociation (α = 0.99); DES-T for dissociation at 2 weeks post-rape (α = 0.89); DES-T for dissociation at 2 months post-rape (α = 0.84); CD-RISC for resilience at 2 weeks post-rape (α = 0.91); ETISR-SF for childhood traumas (α = 0.87); CESD for depression at 2 months post-rape (α = 0.74); and PCL-C for PTSD at 2 months post-rape (α = 0.92).

Differences Between Groups

There were no significant differences between dropouts and participants who completed all assessments on demographic variables, dissociation, childhood trauma, PTSD, depression, resilience, HIV status, previous sexual assaults, and the number and status (known or not) of the perpetrator.

Adolescents and adults were also compared on demographic and clinical variables. Adolescents and adults did not differ significantly on the aforementioned variables, with the exception of ethnicity χ^2 (3.97) = 10.94, $p = 0.012$. There was 1 black adolescent and 21 black adults, 1 white adolescent and 1 white adult, and 10 colored (mixed race) adolescents and 63 colored (mixed race) adults.

Prevalence of Psychiatric Disorders

The prevalence of clinical depression, as determined on the MINI and MINI KID, was 36.1% at 2 weeks post-rape (n = 35), 22.7% (n = 17) at 1 month, and 10.4% (n = 7) at 2 months.

Self-reported depression, using a cutoff of 16 on the CESD, was 92.8% (n = 90) at 2 weeks post-rape and 48.6% (n = 34) at 2 months. The prevalence of clinical PTSD, as determined on the MINI and MINI KID, was 18.7% (n = 14) at 1 month post-rape and 10.1% (n = 7) at 2 months. The prevalence of self-reported PTSD, using a cutoff of 50 on the PCL-C, was 21.3% (n = 16) at 1 month and 11.4% (n = 5) at 2 months.

Predictors of Dissociation, PTSD, and Depression

Table 2 presents the simple regression models and Table 3 presents the multiple regression models with predictor variables, their standardized coefficients, and the significance levels for outcome variables: dissociation at 2 months (model 1), PTSD at 2 months (model 2), and depression at 2 months (model 3). Variables that had a significant relationship with the outcome variable in bivariate analyses were entered into each model as predictor variables. Table 4 contains the summary statistics for the 3 multiple regression models.

Dissociation

Dissociation prior to the rape, dissociation at 2 weeks, resilience at 2 weeks and resilience at 1 month were significant independent predictors of dissociation at 2 month post-rape in simple regression models. Childhood trauma was not significantly correlated with dissociation at 2 months and was therefore excluded from further analysis. Dissociation prior to the rape and dissociation and resilience at 2 weeks and 1 month post-rape were consequently entered into a multiple regression model.

TABLE 3. Parameters for the Multiple Regression Models: Variables Predicting Dissociation, PTSD, and Depression

| Model | | N | Unstandardized | | Standardized β-Coefficients | t | Sig. | 95% Confidence Interval | |
			B	Std. Error				Lower Limit	Upper Limit
1	Dissociation at 2 mo (Constant)	56	7.74	3.55		2.18	0.034	−1.06	21.85
	Dissociation at 2 wk (DES-T)		0.16	0.04	0.49	3.81	0.000*	0.14	0.37
	Prior dissociation (DES-T)		0.06	0.11	0.07	0.54	0.591	−0.18	0.17
	Resilience at 2 wk (CD-RISC)		−0.09	0.06	−0.22	−1.40	0.168	−0.36	0.05
	Resilience at 1 mo (CD-RISC)		−0.01	0.06	−0.04	−0.24	0.814	−0.18	0.21
2	PTSD at 2 mo (Constant)	64	33.71	6.69		5.04	0.000	20.33	47.08
	Dissociation at 2 wk (DES-T)		0.16	0.08	0.31	2.07	0.043*	0.01	0.31
	Dissociation at 1 mo (DES-T)		0.07	0.12	0.08	0.58	0.561	−0.18	0.32
	Prior dissociation (DES-T)		0.08	0.11	0.09	0.72	0.473	−0.14	0.29
	Resilience at 2 wk (CD-RISC)		−0.12	0.09	−0.17	−1.35	0.182	−0.29	0.06
3	Depression at 2 mo (Constant)	70	15.37	5.16		2.98	0.004	5.07	25.67
	Dissociation at 2 wk (DES-T)		0.09	0.04	0.25	2.16	0.035*	0.01	0.17
	Resilience at 2 wk (CD-RISC)		−0.08	0.05	−0.19	−1.57	0.120	−0.19	0.02
	Age		0.26	0.12	0.24	2.20	0.032*	0.02	0.50

CD-RISC = Connor–Davidson Resilience Scale, CESD = Center for Epidemiologic Studies Depression Scale, DES-T = Dissociative Experiences Scale—Taxon, ETISR-SF = Early Trauma Inventory Self Report—Short Form, PCL-C = PTSD Checklist Civilian version, PTSD = posttraumatic stress disorder. 1—Outcome: dissociation at 2 mo (DES-T), 2—Outcome: PTSD at 2 mo (PCL-C), 3—Outcome: depression at 2 mo (CESD).
* $P < 0.05$.

Model 1 explained 38.2% of the variance in dissociation at 2 months ($F(4.52) = 9.64$, $p < 0.000$). Prior dissociation (β = 0.06, $t(56) = 0.54$, $p = 0.591$) and resilience at 2 weeks (β = −0.09, $t(56) = −1.40$, $p = 0.168$) and 1 month (β = −0.01, $t(56) = −0.24$, $p = 0.814$) post-rape were not significant predictors in this model. Dissociation 2 weeks post-rape (β = 0.16, $t(56) = 3.81$, $p < 0.000$) was the only significant predictor of dissociation at 2 months.

PTSD

Dissociation prior to the rape, dissociation at 2 weeks and 1 month, and resilience at 2 weeks post-rape were significantly correlated with PTSD at 2 months post-rape and were significant individual predictors of dissociation at 2 months post-rape in simple regression models. Childhood trauma was not significantly correlated with PTSD at 2 months post-rape. Dissociation prior to the rape, dissociation at 2 weeks and 1 month, and resilience at 2 weeks post-rape were entered into a multiple regression model. Model 2 explained 20.7% of the variance in PTSD status at 2 months ($F(4.60) = 5.19$, $p = 0.001$). Resilience at 2 weeks post-rape (β = −0.12, $t(64) = −1.35$, $p = 0.182$), dissociation prior to the rape (β = 0.08, $t(64) = 0.72$, $p = .473$), and dissociation at 1 month (β = 0.07, $t(64) = 0.58$, $p = 0.561$) post-rape were not significant predictors of PTSD at 2 months post-rape. Dissociation at 2 weeks post-rape (β = 0.16, $t(64) = 2.07$, $p = 0.043$) was the only significant predictor of PTSD at 2 months post-rape.

Depression

Dissociation at 2 weeks post-rape, resilience at 2 weeks post-rape, and age significantly correlated with depression at 2 months post-rape and were significant individual predictors of depression at 2 months post-rape in simple regression models. The multiple regression model (model 3) explained 16.4% of the variance in depression at 2 months post-rape ($F(3.66) = 5.50$, $p = 0.002$). Resilience at 2 weeks post-rape was not a significant predictor of depression (β = −0.19, $t(69) = −1.57$, $p = 0.120$) at 2 months post-rape. Dissociation at 2 weeks post-rape (β = 0.25, $t(69) = 2.16$, $p = 0.035$) and age (β = 0.24, $t(69) = 2.20$, $p = 0.032$) were significant predictors of depression at 2 months post-rape.

DISCUSSION

The present study examined the relationship between traumatic dissociation, resilience, depression, prior dissociation, childhood traumas, and PTSD in rape survivors. We found a 10.5% prevalence of major depression and 10.1% prevalence of PTSD at 2 months. These prevalence rates

TABLE 4. Model Summary for Multiple Regression Models: Predicting Dissociation, PTSD, and Depression

Model	R^2	ΔR^2	F	df1	df2	p
1	0.426	0.382	9.64	4	52	0.000†
2	0.257	0.207	5.19	4	60	0.001*
3	0.200	0.164	5.50	3	66	0.002*

CD-RISC = Connor–Davidson Resilience Scale, CESD = Center for Epidemiologic Studies Depression Scale, DES-T = Dissociative Experiences Scale—Taxon, PCL-C = PTSD Checklist Civilian version, PTSD = posttraumatic stress disorder. 1—Predictor: dissociation at 2 wk (DES-T), dissociation at 1 mo (DES-T), resilience at 2 wk (CD-RISC), resilience at 1 mo (CD-RISC); Outcome: dissociation at 2 mo (DES-T). 2—Predictors: dissociation at 2 wk (DES-T), dissociation at 1 mo (DES-T), prior dissociation (DES-T), resilience at 2 wk (CD-RISC); Outcome: PTSD at 2 mo (PCL-C). 3—Predictor: dissociation at 2 wk (DES-T), resilience at 2 wk (CD-RISC), age; Outcome: depression at 2 mo (CESD).
* $P < 0.05$.
† $P < 0.01$.

are considerably higher than the 12-month prevalence rates for depression (4.9%) and PTSD (0.6%) in the general South African population.[73] However, the rates were also considerably lower than those found in the previous rape studies wherein a lifetime prevalence of 42% to 56% for depression and 24% to 65% for PTSD has been found.[74,75] The reported studies did not focus on the 12-month prevalence of PTSD and depression. Elklit and Christiansen[76] found a PTSD prevalence rate of 35% in rape victims 3 months post-rape. Depression was not measured in their study. Severely traumatized participants recruited in this study received counseling at the recruitment site. They were also referred for further counseling by the researcher if indicated. The low rates of PTSD and depression may be explained, in part, by early intervention offered to participants before, during, and post-data collection.

The primary aim of the study was to determine the predictive value of traumatic dissociation, resilience, childhood trauma, and demographic variables in the development of PTSD. The predictive value of traumatic dissociation, resilience, childhood trauma, and demographic variables in the development of depression and the development and maintenance of dissociation was also tested.

First, in the multiple regression models, we found that dissociation at 2 weeks post-rape was a significant predictor of dissociation, PTSD, and depression at 2 months post-rape. The literature on the relationship between traumatic dissociation and PTSD is mixed. Although some studies report a definite relationship between dissociation and PTSD,[12,13,15–17] others report no association with PTSD when other variables are added to the analyses.[77–79] We included resilience at 2 weeks and 1 month as predictors in the multiple regression models (with outcome dissociation at 2 months and PTSD at 2 months) and dissociation remained the only significant predictor. We can conclude from our results that female rape survivors who dissociate soon after a rape are at risk of prolonged dissociation and of developing PTSD and depression.

Comorbid PTSD and depression commonly exist in individuals who have experienced trauma.[1,2,33,34] A prior diagnosis of major depression is associated with increased risk for trauma exposure and consequent PTSD,[30] whereas individuals who develop PTSD are significantly more likely to develop major depression compared with individuals who are trauma exposed but do not develop PTSD.[30–32] This suggests that major depression may be consequent to, comorbid with, or an additional symptom cluster of PTSD.[30,31] Comorbid depression and PTSD may also occur as a result of a generalized susceptibility suggesting common pathogenic mechanisms.[30] One of the underlying mechanisms may be the clustering of resilience factors (eg, personal competence, trust in one's own instincts, strengthening effects of stress, social support, control, and spirituality).[56]

Second, we included prior dissociation as a control variable to control for the confounding effect of prior tendencies to dissociate or prior dissociation unrelated to the rape. Prior dissociation was not a significant predictor of PTSD and there was no significant relationship between prior dissociation and dissociation and depression at 2 month post-rape. Our results suggest that dissociation that is secondary to rape is independently predictive of PTSD and depression among female rape survivors.

Third, we found that dissociation mediated the relationship between resilience and PTSD. Resilience at 2 weeks was also a significant individual predictor of PTSD at 2 months post-rape, suggesting that lower levels of resilience are associated with

higher levels of PTSD. These findings are consistent with previous findings.[18,22,36–40,42,80] However, when dissociation at 2 weeks and resilience at 2 weeks were simultaneously entered as predictors in a multiple regression model (model 2: outcome PTSD at 2 months), resilience failed to be a significant predictor of PTSD. This suggests that the variance in resilience at 2 weeks that was associated with PTSD at 2 months (in simple regression) was contained within dissociation at 2 weeks. It also suggests that resilience influences the likelihood of dissociation, but once dissociation is present, resilience no longer has an impact on the risk of developing PTSD. Dissociation has been described as a defense mechanism that allows individuals to separate themselves from physical or psychological pain.[81] Dissociation following trauma may be used as a coping (defense) mechanism when confronted with future traumatic events.[82] This suggests that past dissociation (eg, following exposure to childhood trauma) can increase the likelihood of a dissociative response with future trauma and that dissociation may become a form of resilience for immediate coping.[83,84]

Investigation of other sources of resilience (eg, social support and attachment styles) may have strengthened our findings related to resilience, given the unique social circumstances in South Africa and the potentially varied responses to adversity. Poverty, gender inequality, single parenthood, and child-headed households (due to HIV deaths) are common.[85] The lack of emotional support in the context of the pressures of poverty on parental responsibilities (eg, long working hours and a long commute to work) may negatively influence attachment and social support as coping resources.[85,86] Other related factors, such as high rates of unemployment, substance abuse, and regular exposure to community violence, also place South Africans at risk for mental illness.[85,87–89]

Fourth, we did not find a significant relationship between childhood trauma and dissociation, PTSD, and depression. This finding is in contrast with the previous findings.[21,22] It is possible that the endemic problem of child abuse in South Africa, in the context of daily exposure to violent crime and social and economic disadvantage, contribute to building resilience rather than fostering maladaptive coping mechanisms, for example, dissociation.[90–92] Resilience may be strengthened by sharing of common traumatic experiences.[80] It has been suggested that childhood trauma survivors develop more effective coping strategies if they successfully resolve and integrate the trauma, leading to greater resilience and a lower risk of developing PTSD.[93]

Finally, age was the only demographic variable with a significant relationship to outcome in the multiple regression models. Age was a significant positive predictor of depression. This suggests that older age is associated with a higher risk for depression among this sample.

A few limitations deserve mention. First, dropout between the first and second visits reduced the number of observations and statistical power for the regression analyses. Future studies should focus on larger samples. Second, participants comprised both adolescents and adults and covered a broad age range. Although there were significant ethnic difference between adolescents and adults, the groups did not differ significantly on other variables. Third, previously found robust predictors of PTSD, for example, perceived life threat and social support, were not measured in this study. Future studies should include these predictors. Last, dissociation prior to the rape was assessed retrospectively and recall bias cannot be excluded.

Several aspects of the sample distinguish this study from previous research. First, no other studies have investigated the

effects of traumatic dissociation on the development of PTSD and depression among rape survivors in South Africa. Second, rape and other sexual assaults are common traumas and the sample demographics are representative of the general population. Third, the homogeneity of the sample is an added strength as there have been few studies on risk factors for PTSD that has focused exclusively on rape trauma. Finally, both self-report and clinical interviews were used to determine PTSD and major depression status.

In conclusion, we found that traumatic dissociation at 2 weeks post-rape was a significant predictor of early PTSD and depression, but not resilience, early childhood trauma, or prior dissociation. Dissociation at a specific time point, related to a specific trauma was therefore predictive of PTSD and depression among female rape survivors and not childhood traumas or a prior tendency to dissociate. Dissociation was a mediator in the relationship between resilience and PTSD. These findings highlight the importance of screening for traumatic dissociation and early intervention among female rape survivors. Adolescents and adults who have been raped arguably manifest with different types of traumatic response and have long-term emotional difficulties, and this requires closer study. Investigation of the relationship between dissociation and other common trauma types in adolescent and adult samples will also be important.

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REFERENCES

1. Ancierno R, Resnick H, Kilpatrick DG, et al. Risk factors for rape, physical assault, and posttraumatic stress disorder in women: examination of differential multivatiate relationships. *J Anxiety Disord.* 1999;13:541–563.

2. Kilpatrick DG, Ruggiero KJ, Ancierno R, et al. Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: results from the national survey of adolescents. *J Concult Clin Psychol.* 2003;71:692–700.

3. McFarlane J, Malecha A, Watson K, et al. Intimate partner sexual assault against women: frequency, health consequences, and treatment outcomes. *Obstet Gynecol.* 2005;105:99–108.

4. Seedat S, Nyamai C, Njenga F, et al. Trauma exposure and posttraumatic stress symptoms in urban African schools. *Br J Psychiatry.* 2004;184:169–175.

5. South African Police Service. An Analysis of the National Crime Statistics. South Africa: South African Government; 2013.

6. Hetzel-Riggin MD, Roby RP. Trauma type and gender effects on PTSD, general distress, and peritraumatic dissociation. *J Loss Trauma.* 2013;18:41–53.

7. Kolltveit S, Lange-Nielsen II, Thabet AA, et al. Risk factors for PTSD, anxiety and depression among adolescents in Gaza. *J Loss Trauma.* 2012;25:164–170.

8. Olff M, Langeland W, Draijer N, et al. Gender differences in posttraumatic stress disorder. *Psychol Bull.* 2007;133:183–204.

9. Stein MB, Walker JR, Forde DR. Gender differences in susceptibility to posttraumatic stress disorder. *Behav Res Ther.* 2000;38:619–628.

10. Tolin DF, Foa EB. Sex differences in trauma and psottraumatic stress disorder: a quantitative review of 25 years of research. *Psychol Bull.* 2006;132:959–992.

11. Arata CM. Child sexual abuse and sexual revictimization. *Clin Psychol Sci Pract.* 2002;9:135–164.

12. Ozer EJ, Best SR, Lipsey TL, et al. Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychol Bull.* 2003;129:52–73.

13. Breh DC, Seidler GH. Is peritraumatic dissociation a risk factor for PTSD? *J Trauma Dissociation.* 2007;8:53–69.

14. Hagenaars MA, van Minnen A, Hoogduin KA. Peritraumatic psychological and somatoform dissociation in predicting PTSD symptoms: a prospective study. *J Nerv Ment Dis.* 2007;195:952–954.

15. Irish LA, Fischer B, Falllon W, et al. Gender differences in PTSD symptoms: an exploration of peritraumatic mechanisms. *J Anxiety Disord.* 2011;25:209–216.

16. Otis C, Marchand A, Courtois F. Peritraumatic dissociation as a mediator of peritraumatic distress and PTSD: a retrospective, cross-sectional study. *J Trauma Dissociation.* 2012;13:469–477.

17. Sugar J, Ford JD. Peritraumatic reactions and posttraumatic stress disorder in psychiatrically impaired youth. *J Trauma Stress.* 2012;25:41–49.

18. Hauck S, Schestatsky S, Terra L, et al. Parental bonding and emotional response to trauma: a study of rape victoms. *Psychotherapy Res.* 2007;17:83–90.

19. Jeavons S, Greenwood KM, Horne DJ. Accident cognitions and subsequent psychological trauma. *J Trauma Stress.* 2000;13:359–365.

20. Ehring T, Quack D. Emotion regulation difficulties in trauma survivors: the role of trauma type and PTSD symptom severity. *Behav Ther.* 2010;41:587–598.

21. Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *J Consult Clin Psychol.* 2000;68:748–766.

22. Schumm JA, Briggs-Phillips M, Hobfoll SE. Cumulative interpersonal traumas and social support as risk and resiliency factors in predicting PTSD and depression among inner-city women. *J Trauma Stress.* 2006;19:825–836.

23. Briere J, Scott C, Weathers F. Peritraumatic and persistant dissociation in the presumed etiology of PTSD. *Am J Psychiatry.* 2005;162:2295–2301.

24. Ehlers A, Clark DM. A cognitive model of posttraumatic stress disorder. *Behav Res Ther.* 2000;38:319–345.

25. Johnson DM, Pike JL, Kathleen CM. Factors predicting PTSD, depression, and dissociative severity in female treatment-seeking childhood sexual abuse survivors. *Child Abuse Negl.* 2001;25:179–198.

26. Arata CM. From child victim to adult victim: a model for predicting sexual revictimization. *Child Maltreatment.* 2000;28:28–38.

27. Classen CC, Palesh OG, Aggarwal R. Sexual revictimization: a review of the empirical literature. *Trauma Violence Abuse.* 2005;6:103–129.

28. Desai S, Arias I, Thompson MP, et al. Childhood victimization and subsequent adult revictimization assessed in a nationally representative sample of women and men. *Violence Vict.* 2002;17:639–653.

29. Filipas HH, Ullman SE. Child sexual abuse, coping responses, self-blame, posttraumatic stress disorder, and adult sexual revictimization. *J Interpers Violence.* 2006;21:652–672.

30. Breslau N, Davis GC, Peterson EL, et al. A second look at comorbidity in victims of trauma: the posttraumatic stress disorder-major depression connection. *Biol Psychiatry.* 2000;48:902–909.

              www.md-journal.com | **7**

31. O'Donnell ML, Creamer M, Pattison P. Posttraumatic stress disorder and depression following trauma: understanding comorbidity. *Am J Psychiatry.* 2004;161:1390–1396.

32. Stein MB, Kennedy C. Major depressive and post-traumatic stress disorder comorbidity in female victoms of intimate partner violence. *J Affect Disord.* 2001;66:133–138.

33. Plichta SB, Falik M. Prevalence of violence and its implications for women's health. *Womens Health Issues.* 2001;11:244–258.

34. Ullman SE, Brecklin LR. Sexual assault history and suicidal behavior in a national sample of women. *Suicide Life Threat Behav.* 2002;32:117–130.

35. Bonanno GA. Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? *Am Psychol.* 2004;59:20–28.

36. Borja SE, Callahan JL, Long PJ. Positive and negative adjustment and social support of sexual assualt survivors. *J Trauma Stress.* 2006;19:905–914.

37. Suzuki SL, Geffner R, Bucky SF. The experiences of adults exposed to intimate partner violence as children: an exploratory qualitative study of resilience and protective factors. *J Emot Abuse.* 2008;8:103–121.

38. Ullman SE, Brecklin LR. Sexual assault history and suicidal behavior in a national sample of women. *Suicide Life Threaten Behav.* 2002;32:117–130.

39. Bowland S, Biswas B, Kyriakakis S, et al. Transcencing the negative: spiritual struggles and resilience in older female trauma survivors. *J Relig Spiritual Aging.* 2011;23:318–337.

40. Courtois CA. Complex trauma, complex reactions: assessment and treatment. *Psychotherapy Theor Res Pract Training.* 2004;41:412–425.

41. Liotti G. Trauma, dissociation, and disorganized attachment: three strands of a single braid. *Psychotherapy Theor Res Pract Training.* 2004;41:472–486.

42. Liotti G. A model of dissociation based on attachment theory and research. *J Trauma Dissociation.* 2008;7:55–73.

43. Markowitz JC, Milrod B, Bleiberg K, et al. Interpersonal factors in understanding and treating posttraumatic stress disorder. *J Psychiatric Pract.* 2009;15:133–140.

44. Muller RT, Sicoli LA, Lemieux KE. Relationship between attachment style and posttraumatic stress symptomatology among adults who report the experience of childhood abuse. *J Trauma Stress.* 2000;13:321–332.

45. Twaite JA, Rodriguez-Srednicki O. Childhood sexual and physical abuse and adult vulnerability to PTSD: the mediating effects of attachment and dissociation. *J Child Sex Abuse.* 2004;13:17–38.

46. Charuvastra A, Cloitre M. Social bonds and posttraumatic stress disorder. *Annu Rev Psychol.* 2008;59:301–328.

47. Gibson LE, Leitenberg H. The impact of child sexual abuse and stigma on methods of coping with sexual assault among undergraduate women. *Child Abuse Negl.* 2001;25:1343–1361.

48. Walsh F. Traumatic loss and major disasters: strengthening family and community resilience. *Fam Process.* 2007;46:207–227.

49. Marx BP, Calhoun KS, Wilson AE, et al. Sexual revictimization prevention: and outcome evaluation. *J Consult Clin Psychol.* 2001;69:25–32.

50. Waller NG, Putnam FW, Carlson EB. Types of dissociation and dissociative types: a taxometric analysis of dissociative experiences. *Psychol Methods.* 1996;1:300–321.

51. Bernstein EM, Putnam FW. Development, reliability, and validity of a dissociation scale. *J Nerv Ment Dis.* 1986;174:727–735.

52. Carlson EB, Putnam FW, Ross Torem M, et al. Validity of the Dissociative Experiences Scale in screening for multiple personality disorder: a multicenter study. *Am J Psychiatry.* 1993;150:1030–1036.

53. Modestin J, Erni T. Testing the dissociative taxon. *Psychiatry Res.* 2004;126:77–82.

54. Bremner JD, Vermetten E, Masure CM. Development and preliminary psychometric properties of an instrument for the measurement of childhood trauma: the Early Trauma Inventory. *Depress Anxiety.* 2000;12:1–12.

55. Bremner JD, Bolus R, Mayer EA. Psychometric properties of the Early Trauma Inventory-Self Report. *J Nerv Ment Dis.* 2007;195:211–218.

56. Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale. *Depress Anxiety.* 2003;18:76–82.

57. Karairmak O. Establishing the psychometric qualities of the Connor-Davidson Resilience Scale (CD-RISC) using exploratory and confirmatory factor analysis in a trauma survivor sample. *Psychiatry Res.* 2010;179:350–356.

58. Radloff L. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psych Meas.* 1977;1:385–401.

59. Boyd JH, Weissman MM, Thompson WD, et al. Screening for depression in a community sample. Understanding the discrepancies between depression and diagnostic scales. *Arch Gen Psychiatry.* 1982;39:1195–2000.

60. Meyers JK, Weissman MM. Use of a self-report symptom scale to detect depression in a community sample. *Am J Psychiatry.* 1980;137:1081–1084.

61. Pretorius B. Cross-cultural application of the Center for Epidemiological Studies Depression Scale: a study of Black South African students. *Psychol Rep.* 1991;69:1179–1185.

62. Roberts RE, Vernon SW. The Center for Epidemiological Studies Depression Scale: its use in a community sample. *Am J Psychiatry.* 1983;140:41–46.

63. Ghubash R, Daradkeh TK, Al Naseri KS, et al. The performance of the Center for Epidemiology Study Depression Scale (CES-D) in an Arab female community. *Int J Soc Psychiatry.* 2000;46:241–249.

64. Iwata N, Buka S. Race/ethnicity and depressive symptoms: a cross-cultural/ethnic comparison among university students in East Asia, North and South America. *Soc Sci Med.* 2002;55:2243–2252.

65. Munet-Vilaro F, Folkman S, Gregorich S. Depressive symptomatology in three Latino groups. *West J Nurs Res.* 1999;21:209–224.

66. Guarnaccia PJ, Angel R, Worobey JL. The factor structure of the CES-D in the Hispanic Health and Nutrition Examination Survey: the influences of ethnicity, gender and language. *Soc Sci Med.* 1989;29:85–94.

67. Roberts RE, Rhoades HM, Vernon SW. Using the CES-D scale to screen for depression and anxiety: effects of language and ethnic status. *Psychiatry Res.* 1990;31:69–83.

68. Weathers FL, Litz BT, Herman DS, et al. The PTSD Checklist: Reliability, Validity, and Diagnostic Utility: Trauma, Coping and Adaptation San Antonio, Texas: International Society for Traumatic Stress Studies; 1993.

69. Forbes D, Creamer M, Biddle D. The validity of the PTSD checklist as a measure of symptomatic change in combat-related PTSD. *Behav Res Ther.* 2001;39:977–986.

70. Ruggiero KJ, Del Ben K, Scotti JR, et al. Psychometric properties of the PTSD checklist: civilian version. *J Traumatic Stress.* 2003;16:495–502.

71. Wilkins KC, Lang AJ, Norman SB. Synthesis of the psychometric properties of the PTSD checklist (PCL) military, civilian, and specific versions. *Depress Anxiety.* 2011;28:596–606.

72. Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview: the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychol.* 1998;59:34–57.

73. Herman AA, Stein DJ, Seedat S, et al. The South African Stress and Health (SASH) study: 12-month and lifetime prevalence of common mental disorders. *S Afr Med J.* 2010;99:339–344.

74. Koss MP, Bailey JA, Yuan NP, et al. Depression and PTSD in survivors of male violence: research and training initiatives to facilitate recovery. *Psychol Women Quar.* 2003;27:130–142.

75. Zinzow HM, Resnick HS, McCauley JL, et al. The role of rape tactics in risk for posttraumatic stress disorder and major depression: results from a national sample of college women. *Depress Anxiety.* 2010;27:708–715.

76. Elklit A, Christiansen DM. ASD and PTSD in rape victims. *J Interpersonal Violence.* 2010;25:1470–1488.

77. Birmes P, Carreras D, Ducasse JL, et al. Peritraumatic dissociation, acute stress, and early posttraumatic stress disorder in victims of general crime. *Can J Psychiatry.* 2001;46:649–651.

78. Holeva V, Tarrier N. Personality and peritraumatic dissociation in the prediction of PTSD in victims of road traffic accidents. *J Psychosom Res.* 2001;51:687–692.

79. Mellman TA, David D, Bustamante V, et al. Predictors of post-traumatic stress disorder following severe injury. *Depress Anxiety.* 2001;14:226–231.

80. Walsh F. Traumatic loss and Major disasters: strengthening family and community resilience. *Fam Process.* 2007;46:207–227.

81. Tasman A, Goldfinger SM. Review of Psychiatry. Washington, DC: American Psychiatric Press; 1991.

82. Briere J. Psychological Assessment of Adult Posttraumatic States: Phenomenology, Diagnosis, and Measurement Washington, DC: American Psychological Association; 2004.

83. Coifman KG, Bonanno G, Ray RD, et al. Does repressive coping promote resilience? Affective: automatic response discrepancy during bereavement. *J Pers Soc Psychol.* 2007;92:745–758.

84. Chavez J. Exploring the adaptiveness of moderate dissociation in response to betrayal trauma. *OUR J.* 2011;1:86–99.

85. Richter LM, Dawes ARL. Child abuse in South Africa: rights and wrongs. *Child Abuse Rev.* 2008;17:79–93.

86. Lalor K. Child sexual abuse in sub-Saharan Africa: a literature review. *Child Abuse Negl.* 2004;28:439–460.

87. Jewkes R, Abrahams N. The epidemiology of rape and sexual coercion in South Africa: an overview. *Soc Sci Med.* 2002;55:1231–1244.

88. Heim C, Nemeroff CB. The role of childhood trauma in the neurobiology of mood and anxiety disorders: preclinical and clinical studies. *Biol Psychiatry.* 2001;49:1023–1039.

89. Pynoos RS, Steinberg AM, Piacentini JC. A developmental psychopathology model of childhood traumatic stress and intersection with anxiety disorders. *Biol Psychiatry.* 1999;46:1542–1554.

90. Abrahams N, Jewkes R, Laubscher R, et al. Intimate partner violence: prevalence and risk factors for men in Cape Town, South Africa. *Violence Vict.* 2006;21:247–264.

91. Bollen S, Artz L, Vetten L, et al. Violence Against Women in Metropolitan South Africa: A Study on Impact and Service Delivery Pretoria: Institute for Security Studies; 1999.

92. Kaminer D, Grimsrud A, Myer L, et al. Risk for post-traumatic stress disorder associated with different forms of interpersonal violence in South Africa. *Soc Sci Med.* 2008;67:1589–1595.

93. Linley PA. Positive adaptation to trauma: wisdom as both process and outcome. *J Trauma Stress.* 2003;16:601–610.